

THE MEDICAL JOURNAL OF AUSTRALIA

VOL. II.—21ST YEAR.

SYDNEY, SATURDAY, NOVEMBER 3, 1934.

No. 18.

Table of Contents

[The Whole of the Literary Matter in THE MEDICAL JOURNAL OF AUSTRALIA is Copyright.]

ORIGINAL ARTICLES—	PAGE.	SPECIAL ARTICLES ON TREATMENT—	PAGE.
"The Principles of Treatment of Acute Infections of the Lungs", by S. A. SMITH, M.B., Ch.M.	567	Fissure in Ano, Fistula in Ano, Suppuration in the Anal and Rectal Regions	588
"The Estimation of Glucose in 0.1 Millilitre of Blood by a Modified Folin-Malmros Method", by H. S. HALCOB WARDLAW, D.Sc., F.A.C.I., and ELIZABETH M. A. PIRIE, B.Sc.	571	BRITISH MEDICAL ASSOCIATION NEWS—	
"Dermatitis Caused by a Mite (Pediculoides Ventricosus) and its Occurrence in Australia", by D. C. SWAN	573	Scientific	590
"Notes on the History of Tuberculosis", by COTTER HARVEY, M.B., Ch.M.	578	Scholarships and Grants in Aid of Scientific Research	594
		Notice	594
REPORTS OF CASES—		CORRESPONDENCE—	
"Non-Syphilitic Aneurysm of Both the Right and Left Femoral Arteries and of the Right Common Iliac Artery", by ARCHIE J. ASPINALL, M.B., Ch.M., F.R.A.C.S.	580	The Mortality in Appendicitis	594
"Acute Pancreatitis with Normal Urinary Diastase", by R. A. MACDOUGALL, M.B., B.S.	582	Medicine and the Microphone	594
REVIEWS—		OBITUARY—	
The Nursing of the Mentally Deficient	582	Daniel Kelly	595
Histology	582	Robert Charles Withington	595
LEADING ARTICLES—		Lillian Helen Alexander	596
Lobar Pneumonia	583	Harold Thornton Bourne	596
CURRENT COMMENT—		CORRIGENDUM	596
Pleural Absorption	584	BOOKS RECEIVED	596
Leprosy	585	DIARY FOR THE MONTH	596
ABSTRACTS FROM CURRENT MEDICAL LITERATURE—		MEDICAL APPOINTMENTS VACANT, ETC.	596
Dermatology	586	MEDICAL APPOINTMENTS: IMPORTANT NOTICE	596
Urology	586	EDITORIAL NOTICES	596

THE PRINCIPLES OF TREATMENT OF ACUTE INFECTIONS OF THE LUNGS.¹

By S. A. SMITH, M.B., Ch.M. (Sydney),
Honorary Physician, Royal Prince Alfred Hospital,
Sydney.

It is a useful thing to review occasionally the principles which underlie the treatment of the most commonly occurring diseases met in practice.

One of the commonest tasks of the general practitioner is the treatment of acute infections of the respiratory system, since they cause greater disability and higher mortality at present than any other group of diseases. The most serious of these infections are those involving the lungs. The majority of fatal cases of lung diseases are those of acute lobar pneumonia.

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on July 26, 1934.

A few years ago one might well have opened a discussion of this subject with the statement that the pneumonias were self-limiting diseases for which no specific remedy was known, and that the only aim of treatment was to assist the patient to withstand the effects of the disease so that his natural powers could eventually overcome it. To what degree is this statement now correct? In what position stands the treatment of pneumonia by specific therapy in Australia today?

It must be recognized at the outset that but little is known of the serum treatment of pneumonia in this country, and it is necessary to review the position in other parts of the world before considering our own conditions.

Although there is much that is obscure in the aetiology of pneumonia, a factor of outstanding importance is the type of organism present. Although inflammation of the entire lobes of the lungs may be due to a number of different organisms

and the clinical characters of the disease may be similar when the infecting organism is different, the great majority of patients (85% to 90%) showing lobar consolidation are infected with a pneumococcus (*Diplococcus pneumoniae*). It has been recognized for some years that the pneumococci can be subdivided into four groups, differentiated by cultural and immunological criteria. Types I, II and III possess very specific and characteristic immune reactions, but Group IV is a heterogeneous group comprising many strains.

Types I and II are not found usually among the ordinary inhabitants of the mouth and respiratory tract, and cause pneumonia by direct transference. When an individual is infected by Type I or II, he has been infected from without from another victim of the disease or from a carrier. As there is a serum which is effective, with certain reservations, against disease arising from these types, the question of specific therapy arises. These types are found commonly in the lobar pneumonias of individuals of middle age or younger. There is considerable evidence that an attack of pneumonia due to Type I or Type II is often followed by a considerable grade of immunity to further infections by these types. Bronchopneumonia is very rarely caused by these types.

Organisms of Type III are more sharply differentiated from Types I and II bacteriologically than they are from each other. They lead a saprophytic existence in the mouths of many healthy individuals, yet the mortality in patients infected with this type is relatively high. This appears to be due to the intervention of other aetiological factors than the type of organism, such as age or the presence of debilitating constitutional diseases which lower the local or general resistance. This type is found more frequently in pneumonia in such individuals than Type I or Type II, and the high mortality is due, not to any high degree of virulence in the bacillus, but rather to the debility or senescence of the host who succumbs to what in the young and vigorous is a relatively mild and uncommon infection. There is no specific serum effective against this type, and there is no evidence of any acquired immunity resulting from infection by it.

Group IV is a heterogeneous group in contradistinction to Types I, II and III. It includes a number of related types, all of which are frequently found as saprophytes in the mouths of healthy individuals. As in Type III, and to a greater extent, other factors, individual and unrelated to the virulence of the strain, play their part in determining an attack of the disease. There is no specific serum known at present against Group IV, and there is no evidence of any lasting immunity following infection by one strain against the same or other strains belonging to this group. Type III and Group IV are found frequently in bronchitis and bronchopneumonia.

In Europe and America the distribution of the various types in patients with lobar pneumonia shows great similarity, except for occasional local

epidemics, in which, in a given locality, one group (especially group IV) will be predominant. An average distribution taken from large series typed in New York, England, Scotland and Italy shows:

Type I	30% to 37%
Type II	23% to 34%
Type III	4% to 19%
Group IV	24% to 33%

In Australia relatively little has been done in determining the distribution, and the fault lies more at the door of the clinician than the pathologist. The communications on this subject are those of A. H. Tebbutt (1920), S. W. Paterson (1922), R. Webster (1924), M. Ross and A. H. Tebbutt (1924), B. Warner (1924). The number of investigations is too small for generalization, but it is noteworthy that in all instances the incidence of Type II is much lower than in other parts of the world, namely, about 9%. It is possible that this is an Australian peculiarity in the distribution of the pneumococci.

In detailing these facts about the characters of the different types, it must be stressed that it is impossible to arrive at any decision as to the type in an individual infection by clinical considerations. It still remains a matter solely for the bacteriologist.

Although there is but little published evidence of the results of specific therapy in Australia, there is a striking general agreement as to its use and its results in other parts of the world. The position is as follows:

1. The serum should not be used in general unless the organism can be typed, and then only in infections of Types I and II. It is useless to rely on clinical considerations as the basis of a guess at the type of pneumococcus.

The benefits from serum are not so emphatic as to make it desirable that all severe cases of lobar pneumonia, irrespective of the type of the infecting pneumococcus, should be treated with Type I and Type II antiserum on the chance that they might belong to a type which is favourably influenced. Moreover, the special technique required for repeated intravenous injections, and the cost of the serum, make the treatment unsuitable for universal application. Each case must be typed as soon as possible, so that the appropriate serum may be used in the optimum dose; the use of the serum is not recommended except under conditions where typing of the pneumococcus can be obtained.

2. Concentrated serum (Felton type) should be used in a total dosage of 80,000 to 120,000 units given in forty-eight hours. If no obvious clinical improvement occurs in this time, it is useless to continue.

3. Specific therapy has little effect in patients over the age of forty years.

4. It is probably useless to use serum later than the fifth day of the disease. The earlier the specific treatment is adopted, the better the result.

5. The use of serum under suitable conditions, namely, early in the course of infection with Type I or Type II in patients under middle age, large doses being given intravenously, reduces the average duration and the severity of the illness and reduces the mortality by approximately 50%. Patients with the most severe grades of infection are not saved

by it, and those with the mildest grades do not need it. It turns the scale in some of those who lie between these two extremes.

The use of serum in this country is not likely to be satisfactory until some organization arises by which it will be possible to commence treatment at the earliest possible moment, to have accurate typing carried out rapidly and to have the necessary supplies of a very expensive serum available. The first of these desiderata presents difficulties because a large proportion of patients are not admitted to the public hospitals early enough in the course of the attack. There is no difficulty in having the typing carried out in the larger urban districts, since competent bacteriologists are freely available. Until some public benevolent arrangements are made, the expense of the serum is a matter for the financial capacity of the patient. Of these three desiderata, the second (typing) presents the least difficulty.

Apart from specific therapy, the aim of treatment is to combat the effects of the infection, whether by pneumococci or other organisms, so that the patient may be placed at the greatest advantage to overcome the disease. In mild infections with slight toxæmia nothing more is needed than good nursing with the promotion of rest and the patient's comfort. But where the toxæmia is more severe, the patient's life may be threatened in various ways. The greatest handicaps he has to overcome are disturbances of respiration and circulation, these being the two main causes which endanger life.

Respiratory Disturbances.

Anoxæmia is the chief manifestation of disturbed respiratory function in pneumonia.

Laboratory investigations on patients show that their arterial blood contains less oxygen in proportion to hæmoglobin than arterial blood from normal individuals. That is, the arterial saturation is abnormally small in many patients with pneumonia. There is much evidence to show that this is not due to the area of lung which is consolidated, but to other causes. Haldane's work indicates that shallow breathing plays an important part, but it is not the only cause. Lundsgaard has adduced evidence to show that other factors may be the presence of a layer of fluid on the inside of the alveoli and an altered condition of the alveolar epithelium. The influence of these factors is important in treatment.

It is important, therefore, that some clinical evidence of this anoxæmia shown by laboratory investigations should be recognized. No studies correlating blood gas analyses with clinical symptoms and signs are available, but there are clues. The question is a complicated one, because in a severe pneumonia there are causes other than, and in addition to, respiratory ones which play their part. But the clinical study of moderately severe grades of anoxæmia, such as occur in high altitudes and in experimental respiration of air with low oxygen content, indicates those symptoms which are

largely due to oxygen lack. The relief of these symptoms by treatment with oxygen and carbon dioxide affords further confirmation.

The most obvious sign is cyanosis, as Lundsgaard says:

For a purely clinical estimation of the presence of anoxæmia or of the grade of the condition, if present, the cyanotic colour is of no less importance than the pallor in anæmia, or the yellow in icterus.

The recognition of cyanosis is simple and easy, and in the majority of patients with pneumonia its presence indicates that that threshold has been reached or passed at which some of the most severe symptoms of anoxæmia make their appearance. It is therefore a sign the early recognition of which is of great importance in treatment. Cyanosis is not invariably an indication of anoxæmia, as, for example, it may be present as a purely local phenomenon or in congenital heart disease and in emphysema, but these conditions present no difficulty of recognition. Further, cyanosis may be absent in anoxæmic patients if they are suffering from extreme anæmia, but again recognition of this latter condition is simple.

The view that cyanosis is an indication of the functional deficiency of the heart and circulation was widely held until blood gas analyses in pneumonic patients established the fact that respiratory disturbances were the main cause.

The most obvious disturbance of respiratory function, namely, increase in the rate of respiration, appears not to be anoxæmic in origin, and periodic breathing, so common in experimental anoxæmia, is rare in pneumonia and of little value as an indication for treatment.

Of other important symptoms which are largely or partly due to oxygen lack, the most important is the occurrence of psychic disturbances. Although these occur in many other febrile diseases in which anoxæmia is not present, they are especially frequent in pneumonia. Even when actual delirium is not present, patients severely ill with pneumonia are frequently highly excitable, sleepless and intractable. Since these conditions occur very frequently in conjunction with cyanosis and are similar to the states of mind seen in experimental anoxæmia, they may be regarded as being due to a large extent to disturbance in the oxygen supply and their disappearance, or improvement, after oxygen therapy is often very striking.

These considerations indicate some of the reasons underlying the use of oxygen in pneumonia. There is no doubt that it is the most valuable single remedy in the treatment of severe grades of the disease, especially where it is mixed with 5% carbon dioxide. It has been my experience that this mixture ("Carbogen") is better tolerated by the patient than pure oxygen and is more effective in removing the cyanosis, in inducing rest and sleep, and in reducing delirium. It has other advantages in that it leads to deeper breathing, preventing occlusion of bronchi and opening up bronchi already occluded. Yandel Henderson goes so far as to claim for the mixture of oxygen and carbon dioxide a bactericidal effect

on the pneumococcus and a resolving action on the exudate. As Lundsgaard remarks:

Every individual suffering from pneumonia has to struggle with an infection which in itself may be serious enough. A number of these patients have to fight under a condition of anoxæmia which at best can never be favourable and which, in some instances, may be the leak which sinks the ship.

There is one further advantage in the use of oxygen and carbon dioxide, and a very material one. The importance of rest to a patient severely ill with pneumonia is only too obvious, and many clinicians have hesitated in the use of morphine, fearing its depressant effect on the respiratory centre. This objection, whatever its validity, disappears with the use of the cylinder of oxygen and carbon dioxide.

Disturbances of Circulation.

The circulatory disturbances in pneumonia arise from the heart itself or from the peripheral circulation. It has come to be accepted that the most frequent cause of death in pneumonia is failure of the circulation and consequently the state of the vascular system is of paramount importance in treatment.

In pneumonia there is extra work on the heart, due to the increased temperature and metabolism and to an increased pressure in the pulmonary circulation. But these factors alone probably do not account for the frequency and severity of the circulatory disturbances. Anoxæmia of cardiac muscle certainly may play a part, but there is ample experimental evidence that toxæmia is the main cause of the circulatory failure.

It has been assumed generally that the main brunt of the disease falls on the myocardium, and this view has dominated treatment. But it is probable that insufficient attention has been paid to failure of the peripheral circulation.

The investigations of many observers on the condition of the myocardium in pneumonia show that changes of an inflammatory or degenerative nature are not frequent, and animal experiments have not produced any demonstrable anatomical myocardial damage. Further, it is noteworthy that auricular fibrillation and heart block are infrequent incidents in the course of the disease. In patients who, prior to the attack, have an undamaged myocardium, definite myocardial disease is rare after recovery from a severe pneumonia. Although it is undeniable that the myocardium, injured by deficient oxygen supply and toxæmia, and hampered by increased resistance, does break down in many instances, yet frequently the failure of the circulation is at its periphery.

Many observations have established the fact that the rate of the pulse is the most significant fact in the circulatory failure of pneumonia. Gibson's view that the blood pressure is the most important criterion of circulatory efficiency has been disproved. Indeed, in many fatal cases the systolic pressure is high. In a large proportion of patients who die of the disease, the symptoms are akin to those of "surgical shock". Ritchie has called this condition

"toxæmic shock" and states that in pneumonia it is usually referred to as heart failure, although the primary failure is peripheral. This condition of the circulation has been attributed to a poisoning of the vasomotor centres in the medulla, but experimental investigation has failed to establish this. Perry, in a study of the reactions of the small vessels of the skin, showed that there was an impaired efficiency in the contractility of the capillaries at the height of the disease, and that their recovery was slow.

Both clinical and experimental observations suggest that frequently in pneumonia both the myocardium and the vasomotor centre are but little damaged, but failure occurs at the periphery of the circulation. The bearing of this on treatment is obvious, since efforts to improve the tone of the small blood vessels are of more importance than attempts to increase the efficiency of the myocardium.

In the treatment of the circulatory disturbances of pneumonia, digitalis has always occupied a foremost part. Opinion of its value is divided, but the weight of evidence is against its use. Even if the myocardium is poisoned by the toxins of the disease there is no reason to believe that digitalis—in a sense, another poison—will improve it. Controlled studies of digitalis therapy appear to have determined this question, since the mortality results among patients treated with digitalis are worse than in patients not so treated. Further, moderate doses of digitalis do not appear to have prevented the appearance of auricular fibrillation or flutter. It appears, therefore, that the routine use of digitalis in pneumonia is not justified and is, indeed, contraindicated. However, if auricular fibrillation or definite signs of congestive heart failure are present, the benefit outweighs the evil and it should be used intensively and without hesitation.

Since peripheral failure has been claimed as the cause of many instances of circulatory failure, treatment aimed at correcting this should be of great value. Hence it is found that adrenaline and, to a less extent, pituitrin and strychnine are signally useful, and rank in value in the treatment of circulatory disturbances with oxygen and carbon dioxide in the treatment of the anoxæmic state caused by the disease.

Apart from treatment directed against the respiratory and circulatory effects of pneumonia, it has been said that, except for quinine, there is no chemotherapy. After some experience with various preparations of quinine, the writer remains unconvinced.

Tradition still sanctions the use of "expectorants", such as ammonium carbonate and ammonium chloride. Recent pharmacological investigation has shown that in the largest doses given therapeutically these have no effect other than to disorder the stomach. There is, indeed, no drug given by mouth which will produce the slightest effect on the condition of the lung in pneumonia:

Among other measures of treatment there is artificial pneumothorax. For this treatment it is claimed that it separates the inflamed pleural surfaces, relieving pain; that it puts the inflamed lung to rest; and that it limits the flow of blood through the consolidated lung, thereby diminishing anoxæmia and toxæmia. An earlier crisis and a more favourable course are said to result. Of this treatment the writer has had no experience. In considering this treatment, it must be remembered that the means at our command of relieving pain and overcoming anoxæmia are far from ineffective, and there are dangers inherent in producing even partial collapse of the lung.

Summary.

1. The present position of specific serum therapy is reviewed.
2. The respiratory disturbances caused by pneumonia are indicated and the importance of cyanosis is recognized. Oxygen with carbon dioxide is the main agent for these conditions.
3. The circulatory disturbances caused by pneumonia are discussed and the means of treatment for heart failure and peripheral circulatory failure considered.
4. Chemotherapy and treatment by artificial pneumothorax are discussed.

THE ESTIMATION OF GLUCOSE IN 0.1 MILLILITRE OF BLOOD BY A MODIFIED FOLIN-MALMROS METHOD.

By H. S. HALCRO WARDLAW, D.Sc. (Sydney), F.A.C.I.,

AND

ELIZABETH M. A. PIRIE, B.Sc. (Sydney).

(From the Department of Physiology, University of Sydney, and the Biochemical Laboratory of the Kanematsu Institute for Pathology, Sydney Hospital.)

THE simple and well known method of Folin and Wu (1920) for the estimation of blood sugar can readily be adapted for use without the aid of a colorimeter. The quantity of blood required for a determination, however, necessitates obtaining the specimen by venipuncture. The equally well known method of Hagedorn and Jensen (1923) does not require a colorimeter and uses only 0.2 millilitre of blood, a quantity which can be obtained readily from a finger prick. A micro-burette is required, however, the procedure is a good deal more complicated than that of the Folin-Wu method, and two of the solutions used must be accurately quantitative, but are unfortunately rather unstable.

The colorimetric method published by Folin and Malmros in 1920 requires only 0.1 millilitre of blood for an estimation, is almost as simple as the method of Folin and Wu and, like the method of Hagedorn and Jensen, gives values which approximate to the true glucose content of the blood. As in colorimetric methods in general, the only strictly quantitative solution required is a standard solution of

glucose. The colours obtained in this method are very easily matched when viewed through a suitable colour filter.

This method is readily adapted for use with no apparatus more complicated than a couple of pipettes and some test tubes. It combines many of the advantages of the Folin-Wu method with those of the Hagedorn-Jensen method. The following are the essential details of the modified method.

Principle of Method.

The reducing sugar contained in 0.1 millilitre of blood is allowed to reduce ferricyanide in solution to ferrocyanide. The ferrocyanide so formed reacts with a ferric salt in the presence of a protective colloid to give a colloidal solution of Prussian blue. The colour of the solution is compared with that obtained with a standard solution of glucose. The darker solution is diluted until it matches the lighter. From the dilution necessary the glucose content of the blood is calculated.

Solutions Required.

The following solutions are required:

1. Protein precipitant. Dissolve two grammes of sodium tungstate in about 800 millilitres of water. Add 20 millilitres of $\frac{2}{3}$ N sulphuric acid with mixing. Make up to 1,000 millilitres.
2. Ferricyanide solution. Dissolve two grammes of chemically pure potassium ferricyanide in water and dilute to 500 millilitres. Keep in the dark in a brown bottle.
3. Sodium cyanide-carbonate solution. Dissolve eight grammes of sodium carbonate in about 100 millilitres of water. Make up an approximately 1% solution of sodium cyanide. Add 150 millilitres of this solution to the solution of sodium carbonate and make up to 500 millilitres.
4. Ferric iron solution. Suspend 20 grammes of gum ghatti overnight in a gauze bag under the surface of 1,000 millilitres of water in a tall vessel. Remove the gum and add to the solution five grammes of anhydrous ferric sulphate dissolved in 75 millilitres of 85% phosphoric acid (specific gravity 1.75) plus 100 millilitres of water. Add 1% potassium permanganate little by little to the solution, as long as the colour is rapidly discharged, to oxidize any reducing material present. About fifteen millilitres are required. Gum arabic may be used in place of the gum ghatti. For this only about two millilitres of the permanganate are required for the same quantity.
5. Standard glucose solution. Stock solution: one gramme of dry chemically pure glucose dissolved in water containing 0.2 gramme of benzoic acid as a preservative and made up to 100 millilitres. This solution keeps well in the cold. Working standard: dilute one millilitre of the above solution to 1,000 millilitres immediately before use (1 millilitre = 0.01 milligramme glucose). These are the only quantitative solutions used. They must be made up accurately.

Apparatus Required.

The following apparatus is required:

Light Filter. Soak filter paper in a solution of five grammes of picric acid dissolved in 100 millilitres of methyl alcohol to which five millilitres of 10% sodium hydroxide solution have been added. Painting these filters, after drying, with a solution of paraffin wax in petrol makes them more permanent.

Test Tubes. Six test tubes, five-eighths of an inch by six inches, for one determination, a test tube rack, water bath and a burner are required. The test tubes must be of accurately matched bore. Funnel and filter papers, 11 centimetres, a graduated 10 millilitre pipette, and a 0.1 millilitre capillary blood pipette are also needed.

Procedure.

The procedure is as follows:

Put 10 millilitres of protein precipitant into a test tube.

Allow blood from a finger prick to run by capillarity into a clean, dry 0.1 millilitre pipette. Adjust to mark and wipe the outside of the pipette with a clean linen rag.

Blow blood into the precipitant and wash the pipette out three times with this. Mix thoroughly, stand for five minutes and filter.

Transfer four millilitres of water-clear filtrate and four millilitres of dilute standard glucose solution into test tubes; add two millilitres of ferricyanide solution and one millilitre of cyanide-carbonate solution to each.

Heat tubes for eight minutes in boiling water bath, cool by immersing in cold water; add five millilitres of ferric iron solution to each. Measure ten millilitres of each solution into test tubes of equal bore.

Compare the colours of the solution against good light with a light filter held just behind the tubes.

Add water from a graduated pipette to the darker tube, mixing after each addition until it matches the lighter. Note the volume of water used.

Calculation.

1. If the unknown solution is the darker, $10(10 + \text{millilitres of water required}) = \text{glucose in milligrammes per 100 millilitres of blood}$. If the blood sugar is found to be over 300 milligrammes per 100 millilitres, a more accurate result is obtained by taking 5 instead of 10 millilitres of the blood, doubling the figure for the volume of water used and calculating as above; or the figure may be corrected from Table II.

2. If the standard solution is the darker, $100 \times 10 / (10 + \text{millilitres of water required}) = \text{glucose in milligrammes per 100 millilitres of blood}$.

The following are examples:

(a) Ten millilitres of unknown solution required 9 millilitres of water to match standard: blood sugar = $10(10 + 9) = 190$ milligrammes per 100 millilitres.

(b) Five millilitres of unknown solution required 17 millilitres of water: blood sugar = $10(10 + 17 \times 2) = 440$ milligrammes per 100 millilitres.

(c) Ten millilitres of standard solution required 4 millilitres of water: blood sugar = $100 \times 10 / (10 + 4) = 71$ milligrammes per 100 millilitres.

In Table I figures are given for the concentration of glucose in specimens of blood and of cerebro-spinal fluid obtained by the Folin-Malmros method, (a) using a colorimeter, (b) using the test tube modification described. The two sets of figures show no differences of clinical significance.

TABLE I.
Comparison between Folin-Malmros Method and Modification.
Milligrammes of glucose in 100 millilitres.

Folin-Malmros (colorimeter).	Modification (dilution).
Blood:	
122	120
118	116
104	103
82	83
85	83
105	108
Cerebro-spinal fluid:	
106	108
59	59
101	100
83	83
94	95
81	78
100	99
82	82

Owing to the amount of light absorbed by the picrate filter, a powerful source of light is essential for making the colour comparisons. Folin and Malmros (*loco citato*) state that when a 150-watt "Mazda" lamp is used with a "Daylite" glass filter, strict inverse proportionality holds between colorimeter readings and concentrations of glucose within the range 50 to 400 milligrammes per 100 millilitres. Bright daylight also allows of satisfactory colour comparisons, but the intensity of this source of light varies too much with weather, aspect, and time of day.

As "Daylite" glass is not always readily available, a number of measurements have been carried out with a 75-watt pearl "Mazda" lamp with the picrate filter only. The figures obtained with solutions of glucose ranging in concentration from 50 to 800 milligrammes per 100 millilitres are shown in Table II.

TABLE II.
Concentration of glucose found over range of 50 to 800 milligrammes per 100 millilitres.

Glucose Present. Milligrammes per 100 Millilitres.	Estimations.	Range. Milligrammes per 100 Millilitres.	Mean. Milligrammes per 100 Millilitres.	Correction. Milligrammes per 100 Millilitres.
50	6	52-55	53	-3
75	10	74-78	76	-1
200	16	190-200	193	+7
250	8	235-245	240	+10
300	21	280-296	286	+14
350	7	326-330	328	+22
400	13	370-380	373	+27
500	14	450-460	454	+46
600	13	520-532	523	+77
700	16	556-580	573	+127
800	17	620-660	651	+149

The figures in this table show that without the "Daylite" glass filter the observed figures, when above 100 milligrammes per 100 millilitres, fall below the actual figures to an extent which increases with the concentration of the glucose. Even with this form of illumination the errors up to a concentration of 300 milligrammes of glucose per 100 millilitres are not of clinical significance. The observed figures may be corrected according to the table, or the blood may be diluted to give a figure within a suitable range, as previously mentioned.

Summary.

A modification of the Folin-Malmros method is described by which the glucose in 0.1 millilitre of blood may be determined colorimetrically by dilution without the use of a colorimeter.

Bibliography.

- O. Folin and H. Malmros: "An Improved Form of Folin's Micro Method for Blood Sugar Determination", *Journal of Biological Chemistry*, Volume LXXXIII, 1929, page 115.
O. Folin and H. Wu: "A System of Blood Analysis", Supplement 1, "A Simplified and Improved Method for the Determination of Sugar", *Journal of Biological Chemistry*, Volume XLII, 1920, page 367.
H. C. Hagedorn and B. N. Jensen: "Zur Mikrobestimmung des Blutzuckers mittels Ferricyanid", *Biochemische Zeitschrift*, Volume CXXXV, 1923, page 46.

DERMATITIS CAUSED BY A MITE (PEDICULOIDES VENTRICOSUS) AND ITS OCCURRENCE IN AUSTRALIA.

By D. C. SWAN,
Waite Agricultural Research Institute,
University of Adelaide.

Introduction.

AGRICULTURAL workers in parts of the cereal belt in South Australia may at certain times be troubled by a skin itch, which appears usually after operations such as chaff-cutting or those which involve the handling of hay from stacks a year or more old. The trouble has also been reported from places where chaff and other cereal products are stored. The author has shown in a recent paper (Swan, 1934) that the minute mite *Pediculoides ventricosus* (Newport) 1850 (Acarina, Pediculoididae) commonly occurs in South Australia in these materials. This species had not been reported previously from Australia; it is, however, known from most European countries and the United States of America in connexion with the previously mentioned skin affection, and brief reference will be found to it in most works on medical parasitology.

Professor J. B. Cleland, of this university, has suggested that some details of this matter would be of interest to the medical profession, and an attempt has therefore been made to give a summary of the position, and to indicate where further information may be found.

Biology of *Pediculoides*.

A brief survey of the food supply and environment of the mite is necessary in order to explain its relation to disease.

Pediculoides ventricosus is normally an ectoparasite of a number of insects, particularly of their larval stages. It has needle-like mouth parts, by which it pierces the cuticle and sucks out the body fluids of the host. In the process a secretion, presumably salivary, is injected, which immobilizes the host. A number of species serve as hosts, particularly those which exist in stored products. The cosmopolitan Angoumois grain moth (*Sitotroga cerealella* Oliv.) is a common host; this moth occurs widely in Australia. The adult is a small grey moth, not unlike a clothes moth. Its larvae feed in the grains of cereals, both in store and in haystacks, and probably represent the chief host of the mite in Australia.

The life history of the mite is as follows: The unfed female is about 0.25 millimetre long ($\frac{1}{100}$ inch) (Figure I). It is produced viviparously by

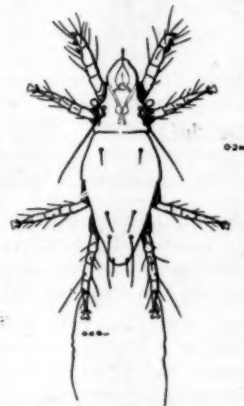


FIGURE I.

Pediculoides ventricosus (Newport). Newly emerged female. Note arrangement of setae and presence of club-shaped sensory organs near second pair of legs. The tips of the mouthparts (chelicerae) are protruding. (After Swan, *Journal of Agriculture of South Australia*, 1934.)

the parent female and is sexually mature at birth, immediately after which it is fertilized by a male. The young female begins feeding as soon as a suitable insect host is found. The tip of the abdomen begins to swell, due to the imbibed fluids, and it becomes spherical in form, attaining up to a millimetre in diameter. Within this sphere the eggs hatch and the embryos develop to maturity before birth and are then extruded through the genital orifice, a process probably unique among the mites. The first young which emerge are males. They are few in number, constituting only about 4% of the progeny (Herfs, 1926). They differ markedly from the females in form (Figure II). They remain in a cluster around the genital aperture of the mother sphere and fertilize the females as they emerge (Figure III). A single female may produce 200 to 300 young. The rate at which the latter are produced varies greatly with temperature: thus at a

mean temperature of 35° C. (95° F.) young appear in six days (Webster, 1910); at 23·8° C. (75° F.), nine days; and at 12·7° C. (55° F.), twenty-eight days. At winter temperatures (10° C. or 50° F. and below) very little, if any, development takes place. It is apparent that under Australian summer conditions a haystack or other suitable environment in which moth and mite occur may soon be infested with numbers of the latter.

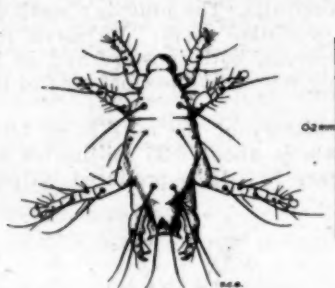


FIGURE II.

Pediculoides ventricosus. Male. The body is pumped in life; the hind pair of legs function chiefly as claspers, in association with the external genital structures. (After Swan, 1934.)

Reasons for the abundance of grain moth in haystacks have been discussed elsewhere (Swan, *loco citato*) and possible measures for control suggested. These involve cutting the crop for hay at an earlier

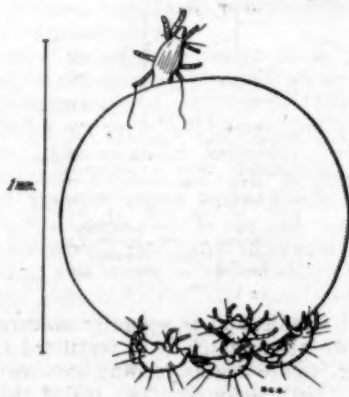


FIGURE III.

A gravid female mite, showing the greatly enlarged abdomen, with four males grouped round the genital aperture. (After Swan, 1934.)

growth stage (namely, at the flowering stage) to avoid the presence of formed grain in the ears, thereby largely removing the food supply of the moth larvae.

The mites appear to overwinter as gravid females. Some of the latter have been kept in the laboratory for a number of weeks during winter (mean temperature 13·2° C. or 56° F. for 61 days—June and July). Young were not produced, but they began to appear soon after the females were placed in the incubator at 22° C. (72° F.).

Relation of Mite to Human Disease.

Unfed female mites move actively through the materials in which they live, in search of insect hosts. Their numbers may be large, so that when such material is handled many find their way to the human skin. Here they appear to behave as they would on an insect host. The skin is pierced and a reaction follows at the seat of each puncture. It is presumed that this is due to a secretion injected during the process. The activity of the mites increases with rising temperature. In cooler weather they may be active on the human body when it is heated by exertion.

There is little question that the mites are but transient parasites of man (compare Askins, 1924, Hase, 1929) and that they do not establish themselves on the skin as they would on their normal hosts. They do not burrow beneath the skin as in the case of *Sarcoptes* (Askins, *loco citato*, Schamberg, 1910, O'Connor, 1913, Webster, 1910). Individual susceptibility to attack appears to vary (Larson, 1925).

The number of bites sustained depends upon length of exposure, the number of mites present, and upon the temperature. If exposure is prolonged, much of the body surface may be involved. A number of severe cases are figured by Schamberg (1910); these resulted to persons who slept on mattresses containing infested straw, the exposure in this case being prolonged. Chaff-cutting or other operations involving the handling of infested materials under Australian conditions probably result as a rule only in scattered bites.

Though reported in association with cases of skin itch in Europe for a number of years (for example, Geber, 1885), experimental proof of the rôle of the mite in the ætiology of the itch was first given by Goldberger and Schamberg (1909), working in the United States of America. They showed that dust from infested material produced the characteristic lesions when applied to the skin for a suitable period, and that a similar sample produced no effects after being exposed for some time to chloroform vapour. They also produced lesions by applying isolated mites to the skin.

The writer has maintained cultures of the mites in the laboratory for some time, and opportunity was taken to make the following tests.

(a) On a cool day (maximum temperature 20° C. or 68° F.), about 50 non-gravid female mites were placed in a small, deep watch-glass and applied to the flexor surface of the forearm. The watch-glass was held in position by a rubber band. The temperature on the skin under the clothing was 32° C. After one hour the mites were removed. They were sluggish in their movements, owing to the low temperature. No lesions developed. It may be added that a similar result was obtained in the field. On a day with a low temperature (maximum 15·5° C. or 60° F.) the writer sustained only two bites after an hour's work in a haystack known to be infested.

(b) Ten mites were isolated and applied in the same manner as described in (a) just before going

to bed. At the end of three and a half hours the watch-glass and mites were removed. It may be taken that the mites had been for most of that time at a temperature near to that of the body, namely 37° C. (98.4° F.). In five hours signs of lesions could be detected. After a further four hours they were distinct, rosy red in colour, with a small conical vesicle at the centre of each. The lesions were grouped within the area covered by the watch-glass. By twenty hours after exposure they were conspicuous, each lesion having a central papule as big as a pin's head. Pruritus was not marked until about twenty-four hours after exposure; some oedema of the surrounding area was present. After a further twelve hours the oedema had practically disappeared and itching had ceased. The itching could readily be renewed for about three days after the original exposure if the lesions were rubbed. It may be noted that on two days of high temperature (maxima 26.6° and 43.3° C. or 80° and 110° F. respectively) work in the haystack mentioned above resulted in a number of bites (up to thirty) being sustained. The mites were moving about very actively, as evidenced by examination of the straw with a binocular microscope.

Description of Symptoms.

A number of names have been used for the characteristic skin eruption by various authors; among the commonest are: "grain itch", "acarodermatitis urticarioides" (Schamberg), "barley itch" (Wills), "grain-mite dermatitis", "straw itch", "mattress itch" (*auctores*), "cotton-seed dermatitis" (Nixon). It is known to agricultural workers in South Australia as "hay itch", from its association with this material. This name has therefore been used in the previous paper (Swan, 1934).

The skin condition has been well described by Goldberger and Schamberg (1909) and by Schamberg (1910). The latter author summarizes its chief features as follows:

1. The disease is characterized by a widespread urticarioid eruption accompanied by intense itching, and commonly by mild fever and other systemic symptoms.
2. The characteristic cutaneous lesion is a wheal surmounted by a minute vesicle which rapidly becomes pustular.
3. Nearly all of the patients exhibit a slight leucocytosis and a moderate eosinophilia, and a certain proportion have albumin in the urine.
4. Microscopic examination of the cutaneous lesions demonstrates that the mite does not burrow into the skin as does the acarus of scabies. The pathological changes in the skin are characteristic of the lesions of urticaria.

All parts of the body are attacked, but, according to the nature of the exposure, certain parts suffer more commonly than others. In the case of agricultural workers, the arms, neck and face, the trunk above the waist, and the legs are affected in that order. Schamberg (1910) gives a number of excellent plates (some reprinted by Webster, 1910) of severely affected patients who had slept on infested mattresses. Here the back and sides were chiefly involved.

The following details are derived partly from the literature and partly from personal observations.

The wheals are rosy red in colour and become apparent ten to sixteen hours after exposure. They reach their maximum development some twenty-four hours after exposure. At this time they may be raised up to two millimetres above the skin level, and the central vesicle, which marks the seat of the puncture, is usually raised and conical in form. Oedema of the surrounding areas may be associated. At this time pruritus becomes pronounced. The lesions become blanched on rubbing and surrounded by an area of erythema. The central vesicle is readily destroyed by rubbing and serum exudes from the site. Considerable excoriation may occur, with consequent risk of bacterial infection. Scratching during sleep may be involuntary. Wheals vary greatly in size and in the degree of elevation. The average diameter is of the order of five millimetres, but double this size is common. Itching usually subsides during the second day, but recurs for a further day or two when the body is warm or when the lesions are rubbed.

While the normal onset of symptoms usually takes place after ten hours or more, a number of cases are cited by various authors where this occurs after a much shorter period. Thus Sergeant and Alary (1916) state that a reaction occurred a "very short time" after exposure. Larson (1925) gives three hours as the shortest time. Schamberg (1910) records sixteen hours as the normal time (page 69), but reports a number of cases from the literature where the reaction occurred in half an hour (page 77); in the act of handling material, "suddenly" (page 78), "immediately" (page 79), "within half an hour" (page 81), "in a few minutes" (page 83). A case was observed locally by Professor Cleland and the writer in which large wheals appeared twenty minutes after exposure. The subject was a farm hand who had been exposed to attack at least once weekly for several months. The reaction resulted after he had pulled sheaves out of a haystack which was heavily infested by mites. In this and the cases cited by the foregoing authors the victims were persons who were engaged in work which would expose them intermittently to the mites; it is possible that the rapid reaction was due to sensitization to the venom that they introduce (see also next section).

No precise data are available relating to symptoms in any local case. Mostly cases have been seen subsequent to the trouble. They are apparently not severe when compared with those reported by Schamberg. The picture given by this author is closely followed in the few examples seen by Professor Cleland and the writer, in so far as the character of the cutaneous lesions is concerned. The usual complaint made related to the irritation, and there did not appear to be any question of malaise or systemic symptoms.

Goldberger and Schamberg (1909) point out that the affection has been confused with ordinary "hives", chickenpox, scabies, and even with smallpox.

Pediculoides and Allergic Disease.

Ancona (1923) reported the occurrence among workers in grain mills in Florence (Italy), of an asthma of a peculiar form. It was associated with dermatitis of the usual type produced by *Pediculoides*; this mite was found to be present in the grain that was being handled. The grain was infested by the moth *Tinea granella* L. All the workers who were exposed continually to the conditions at the mills ultimately developed asthma ("asma epidemico" of Ancona). Ancona considered that the symptoms might be due to inhalation of the mite or its action on the nasal mucous membrane. Storm van Leeuwen (1925) regarded this occurrence as important evidence for identifying allergic with anaphylactic phenomena. He regarded the action of the mite in piercing the skin as providing the sensitization necessary for asthmatic symptoms to result from subsequent contact or inhalation. Grove (1926) reinvestigated Ancona's cases by means of skin reaction tests. She found differences in the skin reactions from those occurring in inherited (atopic) asthma, and could not demonstrate the presence of sensitizing substances in the blood of the two sensitive individuals who showed a marked positive skin reaction. She concluded that Ancona's asthma must be differentiated from other recognized forms. Hase (1929) discussed the general problem of mites in relation to allergia. He regards mites, mite-dust (presumably dead bodies or fragments of mites) and mite faeces as potential allergens.

Baagöe (1933), working in Denmark, reported cases of asthma and vasomotor rhinitis in bakers. He concluded that these symptoms were due to acquired idiosyncrasy to flour; they were not caused by any parasite infesting the flour, as suggested by Ancona and Storm van Leeuwen in the cases cited above. Skin tests made by Baagöe on his patients showed that numerous and violent reactions were produced by wheat (? flour). Much less pronounced reactions were provoked by rye and barley, while oats seldom produced any reaction.

Treatment and Prophylaxis.

For the sake of completeness the following survey is given of such references to treatment and prophylaxis as have been available. Treatment has two objects: to allay the irritation and to prevent secondary infection of excoriated lesions.

Goldberger and Schamberg (1909) found the following ointment useful in relieving the irritation produced by the mites:

Betanaphthol, 2.0 grammes (30 grains).

Sulphuris præcipitati, 4.0 grammes (one drachm).

Adipis benzoati, 30.0 grammes (one ounce).

Sergent and Alary (1916) recommend antiseptic lotions and the application of sulphur to allay the irritation. Llambias and Lorenzo (1920) used a lotion of warm water and vinegar. Castellani and

Chalmers (1913) favour lotions such as calamine, or of dilute carbolic or dilute acetic acid. Stelwagon (1918) recommends carbolized calamine-zinc-oxide lotion or carbolized Lassar's paste. Askins (1924) used soothing ointments and baths of warm water containing soda. As a preventive he recommends smearing exposed parts with grease, followed by a bath after work (a somewhat impracticable expedient). We have found a saturated solution of picric acid in 90% alcohol (suggested by Professor Cleland) effective in relieving irritation. Thompson (1925) used hot soda baths to relieve irritation, and recommends the dusting of flowers of sulphur inside the working clothes to repel mites. Ewing (1925, 1929) reports the successful use of clothing impregnated with a sulphur-soap solution against harvest mites (*Trombicula*); this method he considers more effective than sulphur dust alone. It should apply equally well against *Pediculoides*. Ewing (1925) gives the following formula for the solution used:

Naphtha soap, 120 cubic centimetres (four ounces).

Water (hot), 4.5 litres (one gallon).

Flowers of sulphur, 120 cubic centimetres (four ounces).

After thorough mixing of the ingredients the clothes are dipped in the solution, then wrung out and dried.

It is unlikely that mites persist long in clothing. If necessary, heat treatment at 48.8° C. (120° F.) for an hour could be employed to kill them, or an equally effective way under Australian conditions would be to expose the clothing for some hours to the summer sun.

Methods of Establishing the Presence of *Pediculoides Ventricosus*.

The isolation of the mite is desirable as an aid to the diagnosis of hay itch. The writer has found the following method of examining hay and other material to be convenient. The sample is laid over a large sheet of tin or paper and beaten (for example, with a stick) until as much dust as possible has fallen from it. The material, if collected in the field, is swept up and run into a vessel with a close-fitting lid. In the laboratory it may be further passed through a coarse (30-mesh) sieve to remove larger pieces of debris. The fine dust is spread out in small lots in Petri dishes and examined under the low power of the binocular microscope. The mites move with a characteristic jerky walk through the material. It may be noted that hay, stored cereals *et cetera* support a large insect and mite fauna, from which *Pediculoides* is to be differentiated. Identity is confirmed by examination with the monocular microscope. Glycerine jelly is a convenient mountant. Gloves and tongs may be used in the earlier manipulations, though the chance of odd bites is very slight.

It is recorded that itch of humans associated with stored products *et cetera* infested with rats may be caused by the rat mite *Liponyssus bacoti* (Hirst)

1913. Certain other mite species have also been incriminated on rare occasions.¹

Distribution of *Pediculoides*.*

In addition to Europe and the United States of America, *Pediculoides ventricosus* has also been reported from West Africa, Morocco, Algeria and Egypt. In South Australia it has been found in several localities. It is known from Western Australia, having been found by H. Womersley, now Entomologist, South Australian Museum, in a chaff cargo being loaded on to a ship at Fremantle. A number of lumpers who handled the cargo suffered from dermatitis. Various personal accounts have been received which suggest that the mite is met with, especially during chaff-cutting operations, in many centres in the wheat belt of that State. From a personal account it would appear that it was met with near Canberra some thirty years ago. Mr. Womersley has kindly informed me that he has recently received from Brisbane, Queensland, a specimen of a gravid female of this species for identification. It is probable that the mite and "hay itch" will be found to occur throughout the cereal-growing regions of Australia. It is desirable, however, that, where possible, suspected infested materials from new localities should be examined in order to establish definitely the presence of the mite in them.

Acknowledgements.

The writer is indebted to Dr. J. Davidson and to Professor J. B. Cleland, of the University of Adelaide, who have read through the manuscript and otherwise assisted during its preparation.

Bibliography.

G. Ancona: "Asma epidemico da pediculoides ventricosus", *Il Politecnico (Sezione Medica)*, Volume XXX, February, 1923, pages 45-70.
R. A. Askins: "Dermatitis Caused by *Pediculoides Ventricosus*", *The British Medical Journal*, Volume II, 1924, page 950.

¹ *Liponyssus bacoti* was described by Hirst (1913) and figured in detail (1914). The literature contains a number of reports of human dermatitis due to its bites. In places where this occurred, rats were found to be abundant. The clinical picture is described by Shelmire and Dove (1931). The mite is indicated as a vector of endemic typhus (Brill's disease) in southern United States of America (Dove and Shelmire, 1931, 1932). In this connexion it may be noted that rat fleas are regarded as the chief vectors (for example, Mooser and Castaneda, 1932). *Liponyssus bacoti* is world-wide in its distribution. It has been reported to attack man in the United States of America (Bishopp, 1923, Ewing, 1932, Shelmire and Dove, *loc. citato*), in South Africa (Hirst, 1925), in Germany (Oudemans, 1931). It has been known from Australia since 1908 (Hirst, 1914). Holdaway (1926) recorded it from South Australia, where it attacked man, producing "intense irritation and inflammation, which may last some days". Reference to it is also made by Cleland (1912).

Certain other mites which may be associated with stored products are known to affect man. The family Tyroglyphidae contains a number of species sometimes found in stored products, of which *Glyciphagus domesticus* ("grocer's itch") and *Tyroglyphus longior* var. *castellani* ("copra itch") have been reported as causing dermatitis (for example, Hirst, 1920).

Dermanyssus gallinae and *Liponyssus bursa*, parasites of poultry and pigeons, may infest buildings temporarily and annoy man. *Dermanyssus gallinae* has been met with in Adelaide in this connexion (Davidson, 1932).

² The following reference to hay itch in New South Wales has been found since sending the MS. to press: "Hay that caused skin irritation" (Anonym, *Agricultural Gazette of New South Wales*, Volume XXXII, July, 1921, page 464). Men engaged in cutting chaff at Grafton suffered from skin rashes of eczema. The irritation was believed to be due to a mite, but none was found in the material. The account leaves little doubt that *Pediculoides ventricosus* was involved.

K. Baagøe: "Asthma and Vasomotor Rhinitis in Bakers" (review title), *The British Medical Journal* (epitome), Volume II, 1932, page 168 (abstracted from *Ugeskrift for Laeger*, May, 1932, page 513).

A. Berlese: "*GH Insetti*", Volume II, 1925, page 63.

F. C. Bishopp: "The Rat Mite Attacking Man", United States Department of Agriculture, Departmental Circular 294, 1923.

E. Brumpt: "*Précis de Parasitologie*", Fourth Edition, 1927, pages 855, 911.

W. Castellani and A. J. Chalmers: "A Manual of Tropical Medicine", Second Edition, 1913, pages 613, 1950.

J. B. Cleland: "Injuries and Diseases of Man in Australia Attributable to Animals (except Insects)", Volume XXXII, September, 1912, page 295.

J. Davidson: "Insects Observed on Crops in South Australia during the Period June, 1930, to June, 1932", *Journal of Agriculture of South Australia*, Volume XXXVI, October, 1932, page 286.

W. E. Dove and B. Shelmire: "Tropical Rat Mites, *Liponyssus bacoti* Hirst, Vectors of Endemic Typhus", *The Journal of the American Medical Association*, Volume XCII, November 21, 1931, page 1506.

W. E. Dove and B. Shelmire: "Some Observations on Tropical Rat Mites and Endemic Typhus", *The Journal of Parasitology*, Volume XVIII, 1932, pages 159-168.

H. E. Ewing: "Sulphur Impregnated Clothing to Protect against Chiggers", *Journal of Economic Entomology*, Volume XVIII, December, 1925, pages 827-829.

H. E. Ewing: "Manual of External Parasites", 1929, pages 35, 60.

H. E. Ewing: "Early Records and Present Known Distribution in the United States of Three Recently Introduced Mites", *Proceedings of the Entomological Society of Washington*, Volume XXXIV, February, 1932, pages 13-16.

E. Geber: Article on "The Parasitic Diseases of the Skin" in "Handbook of Diseases of the Skin" (edited by H. von Ziemssen), 1885, page 555.

J. Goldberger and J. F. Schamberg: "Epidemic of an Urticarioid Dermatitis due to a Small Mite (*Pediculoides ventricosus*) in the Straw of Mattresses", *United States Public Health Reports*, Volume XXIV, July, 1909, pages 973-975.

E. F. Grove: "On Asthma and Dermatitis due to Hypersensitiveness to *Pediculoides Ventricosus*", *Journal of Immunology*, Volume XII, October, 1926, page 263.

A. Hase: "Zur Pathologisch-Parasitologischen und Epidemiologisch-hygienischen Bedeutung der Milben, insbesondere der Tyroglyphidae (Käseimilben), sowie über den sogenannten 'milbenkäse'", *Zeitschrift für Parasitenkunde*, Volume I, March, 1929, pages 765-821.

A. Herfs: "Oekologische Untersuchungen an *Pediculoides ventricosus* (Newp.) Berl.", *Zoologica*, Volume XXVIII, 1926, pages 1-68 (long bibliography of biological literature).

S. Hirst: "On Three New Species of Gamasid Mites Found on Rats", *Bulletin of Entomological Research*, Volume IV, 1913, pages 119-124.

S. Hirst: "On the Parasitic Acari Found on the Species of Rodents Frequenting Human Habitations in Egypt", *Bulletin of Entomological Research*, Volume V, 1914, pages 215-219.

S. Hirst: "Species of Arachnida and Myriapoda Injurious to Man", *British Museum (Natural History) Economic Pamphlet*, Number 6 (1920), pages 22, 29.

S. Hirst: "Description of New Acari, Mainly Parasitic on Rodents", *Proceedings of the Zoological Society of London*, 1925, Part I, pages 49-69.

F. G. Holdaway: "A Note on the Occurrence of the Rat Mite, *Liponyssus Bacoti*, in South Australia, together with Descriptions of Certain Stages", *Transactions and Proceedings of the Royal Society of South Australia*, Volume L, 1926, pages 85-88.

A. O. Larson: "Further Notes on Human Suffering Caused by Mites, *Pediculoides ventricosus* Newp.", *Pan-Pacific Entomologist*, Volume II, October, 1925, pages 93-95 [review in *Review of Applied Entomology* (Series B), Volume XIV, page 47].

J. Lambias and D. Lorenzo: "Dermatose causée par un parasite du blé", *Comptes Rendus des Séances de la Société de Biologie*, Volume LXXXIII, December, 1920, page 1523 [review in *Review of Applied Entomology* (Series B), Volume IX, page 37].

H. Mooser and M. R. Castaneda: "The Multiplication of the Virus of Mexican Typhus Fever in Rat Fleas", *Journal of Experimental Medicine*, Volume LV, February, 1932, pages 307-323.

J. A. Nixon: "Cotton-Seed Dermatitis and its Cause, *Pediculoides Ventricosus*", *The Bristol Medico-Chirurgical Journal*, Volume XXXIII, June, 1915, page 73.

F. W. O'Connor: "An Outbreak of Itch due to a Predaceous Mite Occurring in England Among Men Engaged in Unloading Cotton Seed from Egypt", *Transactions of the Society of Tropical Medicine and Hygiene*, London, Volume XIII, May, 1919, pages 10-13 [review in *Review of Applied Entomology* (Series B), Volume VII, page 161].

A. C. Oudemans: "Acarologische Aanteekeningen cxi", *Entomologische Berichten*, Amsterdam, Volume VIII, November, 1931, pages 312-331 [review in *Review of Applied Entomology* (Series B), Volume XX, page 109].

J. F. Schamberg: "Grain Itch (Acarodermatitis Urticarioides): A Study of a New Disease in this Country", *The Journal of Cutaneous Diseases*, Volume XXVIII, February, 1910, pages 67-89.

E. Sergent and A. Alary: "Petite épidémie d'acarirose en Algérie", *Bulletin de la Société de Pathologie exotique*, Paris, Volume IX, Number 10, 1916, pages 771-773 [review in *Review of Applied Entomology* (Series B), Volume V, page 36].

B. Shelmire and W. E. Dove: "The Tropical Rat Mite, *Liponyssus Bacoti* Hirst, 1914: The Cause of a Skin Eruption of Man and a Possible Vector of Endemic Typhus Fever", *The Journal of the American Medical Association*, Volume XCVI, February 21, 1931, page 579.

H. W. Stelwagon: "Treatise on Diseases of the Skin", Eighth Edition, 1918, page 1238 (detailed bibliography to 1918).

W. Storm van Leeuwen: "Allergic Diseases", 1925, page 24.

D. C. Swan: "The Hay Itch Mite, *Pediculoides ventricosus* (Newport) (Acarina, Pediculoididae), in South Australia", *Journal of Agriculture of South Australia*, Volume XXXVII, May, 1934, pages 1289-1299.

A. G. G. Thompson: "Barley Itch", *The British Medical Journal*, Volume I, 1925, page 71.

F. M. Webster: "A Predaceous Mite Proves Noxious to Man", United States Department of Agriculture, Bureau of Entomology Circular, Number 118, 24 pages, April, 1910.

F. C. Willcocks: "The Predaceous Mite, *Pediculoides Ventricosus* Newp.", *Agricultural Journal of Egypt*, Cairo, Volume IV, June, 1914, pages 17-51.

W. K. Willis: *The British Journal of Dermatology*, Volume XXI, August, 1909 (quoted by Schamberg).

NOTES ON THE HISTORY OF TUBERCULOSIS.¹

By COTTER HARVEY, M.B., Ch.M. (Sydney).

Honorary Assistant Physician, the Royal Prince Alfred Hospital; Honorary Physician, the Clinic for Pulmonary Diseases, Royal North Shore Hospital, Sydney.

TUBERCULOSIS is, and always has been, one of the most important diseases with which any civilization has had to grapple. It was observed in the remote past among the first groupings of people. Elliot Smith and his co-workers found unmistakable evidence of Pott's disease in Egyptian dynastic burials of at least 2,000 years B.C. It is not, however, until the time of Hippocrates (460 to 377 B.C.) that we find any clear picture of the ancient conception of tuberculosis. Hippocrates first applied the term phthisis to tuberculosis of the lungs, and he fully appreciated its import: "It is the most grave of all the diseases, the most difficult to cure, and the most fatal." Three causes he recognized: pneumonia without crisis, hæmoptysis, and purulent pleurisy. Though in these he was confused, his descriptions of the clinical phenomena are extraordinarily accurate and, of course, rank among the medical classics. As always, we are impressed by the keen diagnostic acumen of the Father of Medicine. He described the tracheal stridor or death rattle as like "the boiling of vinegar", and pleural friction as "a noise like that of rubbing against a leather strap". The Hippocratic fingers and Hippocratic succussion splash are known to all students. Laennec was led to his discovery of auscultation by reading these observations, though they were forgotten for centuries.

Roman medicine, the heir to Greek traditions, added little to the knowledge of phthisis. Celsus (30 B.C. to A.D. 50) first used the word "tuberculum" and described a tuberculous cold abscess. Aretaeus (A.D. 100) may be noted as having distinguished empyema from phthisis. Galen (A.D. 131 to 201) wrote copiously of phthisis, but regarded the main cause as ulceration of the lung from trauma, a regression from the Hippocratic concept.

Pliny discusses the ancient treatment of this malady. Cough, he states, may be cured by the intake of wolf's lung boiled in wine, bear's bile mixed with honey, or horse's saliva taken three days in succession. Cow's blood mixed with vinegar was in high repute, while a popular course was that of snails taken one on the first day, two on the second, three on the third, back to two on the fourth, and one on the fifth. There is a modern smack in this therapeutic progression. Climatic treatment, however, was well known, and patients were frequently sent to Egypt, with happy result. Sea voyages were also recommended, and Cicero, following a severe hæmoptysis, was apparently cured after two years' voyaging to Greece and Asia.

Both Greek and Roman medicine considered of great importance an adequate and rich dietary, and milk was especially vaunted. Climate and diet were indeed the sheet anchors of treatment at this period of antiquity. For many centuries henceforth no advance can be recorded. It appears certain that tuberculosis was widespread and carried a heavy mortality throughout the middle ages, but it was shaded by the many plagues and other pandemics which swept through Europe. Almost certainly unrecognized at this time as tuberculosis, one variety gains mention often in the literature of the period, and it must have been astonishingly frequent and severe in its incidence, namely, scrofula.

The cure of touching for "The King's Evil" was universally known by the year 1100. Edward I of England treated and cured 288 persons by this method during Easter, 1277; but the world's record for all time appears to be held by the French king Philippe of Valois, who touched 1,500 persons at a single session! It is hard to believe that the practice persisted until 110 years ago. Charles X of France, when crowned in 1824, touched 121 persons presented to him by the two famous surgeons Alibert and Dupuytren.

Though the contagiousness of pulmonary tuberculosis was recognized both by Hippocrates and Galen, there appears to have been no practical application of this belief throughout the middle ages. The idea of contagion was raised again by Fracastoro, better known in the history of syphilis, who, in his "*De Morbis Contagiosis*", devotes a chapter to contagious phthisis. He postulated an infectious element and emphasized the difference between spontaneous phthisis occurring as laid down by Hippocrates and contagious phthisis contracted directly by associating and living with people so afflicted. He also noted its hereditary character: "It is a noteworthy fact that in some families down to the fifth or sixth generation all members perished of this malady, and all at the same age."

After Fracastoro the idea of contagion spread, especially in Italy. It was in this country that the first public health legislation concerning tuberculosis was promulgated. In July, 1699, the Republic of Lucca passed a law making compulsory

¹ Read at a meeting of the Section of the History of Medicine of the New South Wales Branch of the British Medical Association and the Medical Science Club on April 28, 1934.

the notification of tuberculous cases. On receipt of the patient's name and address the authorities took measures for disinfection. In 1754 the Republic of Florence published an edict, part of which reads as follows:

Take care that the patient does not empty his sputum except into vessels of glass or glazed earthenware, and that these utensils be frequently cleansed and boiled. After the patient's death the bed clothes used by him should be boiled in lye at least twice and the same should be done with all clothes of washable wool as well as with mattress and pillow-ticking. The floor of the room should be scrubbed at least two times, and the walls freshly painted.

Venice and Naples followed suit with rigorous laws, including special hospitals and severe penalties for anyone opposing disinfection, or physicians who failed to notify; for the latter there was in Naples "a fine of 300 ducats for first offence and ten years' incarceration for the second".

These enlightened laws were, alas, all of short duration. The idea of contagion in phthisis was born too soon. Social legislation at this time had no scientific basis, and superstitions and vested interests then, as now, proved dragons in the path of progress. By 1783 the laws had all been revoked and forgotten. They are an interesting sidelight in medical history and are the true precursors of our modern preventive and sanitary legislation.

Let us now pass forward to René Laennec (1781 to 1826). Best known for his theory of auscultation, he is certainly the father of modern clinicians. He is also the founder of the modern conception of tuberculosis. Prior to his time the disease was variously subdivided: scorbutic phthisis, syphilitic phthisis, and so on. By his anatomical researches Laennec traced all the changes from tubercles to caseation and cavitation. He ascribed all the various forms, including scrofula, to the one factor, and postulated the unity of tuberculosis. This establishment of a single ætiological cause laid the firm basis on which other workers have built our modern pathological conceptions of this protean disease. Laennec, however, opposed the theory of contagion, regarding a special diathesis as determining the onset of the malady, to which he himself incidentally succumbed at the early age of forty-five years.

For the next fifty years the pages of the history of tuberculosis are strewn with names innumerable of workers in all countries who were keenly studying the disease from many aspects, pathological, clinical and experimental. I shall not weary you with a long list; but some deserve mention: Gendrin, who first described bovine tuberculosis; Schönlein, who first gave the disease its name, tuberculosis; Rokitauský, who, by his anatomical and microscopical studies, distinguished between the various forms of the tubercle. In England, Sir James Clark was making notable studies on phthisis from the clinical aspects. He emphasized the social significance of the disease and the great importance of hygienic measures. He was the first to return to the old and forgotten principle of the Hippocratic

and Italian schools, and for this he deserves an honourable place in the history of tuberculosis.

The founder of modern pathology, Rudolph Virchow, now appeared on a scene of scientific controversy. A giant of his time, he nevertheless opposed the unity of tuberculous lesions as laid down by Laennec; he considered that scrofula and tuberculosis were independent, and maintained that ordinary inflammatory lesions might end in tuberculous caseation. He thus unfortunately greatly retarded the later development of research.

In 1865, then, there were two great schools of opinion in Europe, the followers of Laennec and of Virchow. With the experimental studies of Villemin and his followers at this period there commenced a new epoch of evolution in the conception of tuberculosis, wherein experimental research and exact clinical observations predominated.

In 1868 Villemin published the results of his experiments. He produced tuberculosis in animals by inoculation of tuberculous material, and maintained, therefore, that the cause of tuberculosis was a germ which carried a specific tuberculous virus and which was air-borne. His emphatic denial of the spontaneous origin of the disease within the organism produced a storm of the first magnitude in the scientific world. However, his opponents could no longer rely, as of yore, on dialectics and quotations from the classics. They had to counter-balance experiment with experiment. Everywhere in Europe animal experiments, a new method of research, were initiated. Practically all confirmed Villemin's views. Klebs went further and found that human tuberculosis was transmissible to animals and that sputum was the most frequent virus carrier. Johnes found that milk and foods could transmit tuberculosis.

By 1880 the specificity of infection in tuberculosis was generally admitted, and active research was in progress for the specific virus. One of the most energetic workers was Klebs, Villemin's staunchest disciple, who stated that the virus might be found in a certain species of bacteria which he cultivated and named *Monas tuberculosis*. They may be identical with the modern coccoid forms of the *Mycobacterium tuberculosis*.

Therapy at this time was returning to the Hippocratic traditions. English physicians, foremost, as always, in matters of public health, were recommending open air and adequate diet. In 1840 Bodington wrote on the merit of fresh air, and built the first sanatorium. As is often the fate of pioneers, he was ridiculed and so severely criticized that he gave up his project and converted the building into a lunatic asylum. Brehmer in 1859 founded the first successful sanatorium, in Germany, though opposition was as fierce then as in the time of Bodington. However, the idea slowly made headway, and the numbers of sanatoria increased. Today, of course, they are accepted as an integral part of the anti-tuberculosis armamentarium of every country, and the modern sanatorium, conspicuous by its absence in our State, performs wonderful work.

We come now to the famous year 1882. On March 24 Robert Koch read before the Berlin Physiological Society his memorable communication of his discovery of the tubercle bacillus. This contribution of his is undoubtedly the most important of all chapters in the history of tuberculosis. With Koch's discovery the truth of the unitarian theory was finally confirmed. The specific feature of tuberculosis is not the tubercle or any anatomical detail, but the bacillus. Thus was initiated a series of researches on tuberculosis almost exclusively from the viewpoint of bacteriology. The pendulum indeed swung too far. Bacteria in medicine now ruled the situation; they were regarded as the sole ætiological factor in nearly all acute diseases, even though not as yet discovered, as well as tuberculosis. Gradually, however, the balance returned, and modern medicine accepts with all its amplifications of immunity, diathesis, allergy and the like, the parallel between infection in tuberculosis and the parable of the sower.

Koch's other contributions must be mentioned. First was his attempt to find a specific remedy, leading to his report in 1890 on tuberculin, from which followed great hopes and profound disillusion. Second was his statement in 1901 that human and bovine tuberculosis were entirely independent diseases. The value of this lay in the immense amount of research to which it gave rise, in Germany, England and America, leading to definite proof that both forms of the disease are inter-transmissible and that the bovine form is common and serious, particularly in children. Robert Koch enriched in many ways scientific medicine, and his discovery of the bacillus which often bears his name is one of the great landmarks in medical history.

Just a few words concerning some pioneers in modern treatment. Robert Philip must be remembered, for he founded, in 1887, the first anti-tuberculosis dispensary. Though the date is a little uncertain, it would appear that in 1888 C. Forlanini first carried out artificial pneumothorax for the treatment of pulmonary tuberculosis, a method he had advocated six years previously. Actually an English physician, Carson, first suggested this form of therapy in 1822. Of this treatment, Riviére, one of England's pioneers, justly wrote seventeen years ago:

No more hopeful ray of sunshine has ever come to illumine the dark kingdoms of disease than that introduced into the path of the consumptive through the discovery of artificial pneumothorax.

Collapse therapy, which some physicians curiously consider to be still in the experimental stage, is thus nearly fifty years old. Its recent development to include thoracic surgery is perhaps not yet a matter of history.

This is a very brief and inadequate sketch of the history of tuberculosis to the present time. It is certain that many new chapters have yet to be written. Despite the magnificent advances that have been made in our knowledge and control of this

disease, we have no reason to exult. It is a sobering reflexion that, between the ages of fifteen and forty-five, that period of greatest usefulness and productivity to the State, consumption takes the heaviest toll of all mortal diseases; it is here still, as in John Bunyan's time, Captain of the Men of Death.

In humility we can but echo the late Sir James Kingston Fowler's words: "When the struggle against tuberculosis began, no one knows; when it will end, no one can tell."

Acknowledgement is due to many sources, but chiefly to a recent monograph, "The History of Tuberculosis", by Professor Castiglioni, from which much of the information in this paper has been drawn.

Reports of Cases.

NON-SYPHILITIC ANEURYSM OF BOTH THE RIGHT AND LEFT FEMORAL ARTERIES AND OF THE RIGHT COMMON ILIAC ARTERY.

By ARCHIE J. ASPINALL, M.B., Ch.M. (Sydney), F.R.A.C.S.,
Honorary Surgeon, Sydney Hospital.

FRANK S., aged twenty-four years, single, born in Sydney, by occupation an engineer, was first admitted to Sydney Hospital on September 28, 1922.

The patient complained of pain in the inner side of the right thigh, the pain was severe, was of two months' duration, and was brought on by exercise. He also complained of pain in the right shin, severe, aching, and deep-seated, of ten days' duration, and of pain, dull and nagging in character, disturbing his sleep, situated over a swelling on the inner side of the right thigh. He stated that a numbness had developed along the shin bone at the same time as the pain in the shin. An increased prominence of the veins in the right leg appeared ten days before his admission to hospital.

On examination a tumour was found, situated on the inner side of the right thigh in the region of Scarpa's triangle, noticed first seven days ago, the patient's attention being drawn to it by the pulsations and dull, nagging pain. There was no history of scarlet fever, rheumatic fever, or syphilis.

It was found that the respiratory, alimentary, genito-urinary, and nervous systems were normal, and the cardiovascular system appeared normal.

A pulsating tumour was found, situated on the inner side of the right thigh, in the line of the femoral artery; a systolic murmur was audible over it, and also over the whole femoral artery. No pulse could be detected in the *dorsalis pedis* or posterior tibial arteries.

The right thigh was 3.1 centimetres (one and a quarter inches) greater in circumference than the left. The temperature of both legs was normal.

Examination of the left leg disclosed a pulsating tumour situated just below the left inguinal ligament. On palpation there was a rough thrill; on auscultation a systolic murmur.

From this time until surgical treatment was afforded, considerable pain was experienced in the left thigh.

The Wassermann test gave no reaction. X ray examination of the right thigh for newgrowth disclosed no bone involvement.

Operation was performed by the late Sir Herbert Maitland. A proximal ligation of the right femoral artery was performed, and at the operation the wall of the femoral artery was found to be as thin as a vein. Convalescence, as regards the right leg, was from then on uninterrupted.

Three weeks after ligation of the artery in the right leg, an operation was performed for proximal ligation of the left femoral artery. The wall of the left artery presented the same thin vein-like structure as that of the right.

After operation a histological examination of lymph gland from the right groin was made; inflammatory hyperplasia was found.

A full blood count revealed the following information:

Erythrocytes, per cubic millimetre	5,730,000
Hæmoglobin value	67%
Colour index	0.57
Leucocytes, per cubic millimetre	9,000
Polymorphonuclear cells	46%
Small lymphocytes	47%
Large lymphocytes	34%
Transitional cells	9%
Eosinophile cells	4%

400
cells
counted.

The subsequent progress was again good, and six weeks later the patient, who was then walking about, was discharged from hospital.

Subsequent investigation showed that the man had enjoyed good health for four years and carried on his occupation as an engineer. However, he had to be readmitted to hospital on July 23, 1926.

On readmission to hospital the patient stated that he was experiencing pain situated in the right knee and pain across the small of his back; also a swelling situated in the lower part of the abdomen, on the right side.

Examination revealed a round, pulsating tumour, about the size of a small orange, situated half way between the umbilicus and the anterior-superior iliac spine.

Further investigations were now made. An X ray examination made for the purpose of showing whether there was evidence of any abnormality of the aorta or pelvis showed no aortic dilatation and no bony irregularity of the pelvis. The Wassermann test yielded no reaction.

A full blood count was made, and in the accompanying table, the counts before and after operation are compared.

Observation.	Pre-Operative.	Post-Operative.	
	Count on Day of Operation. Patient Pale.	Count One Week After Operation. Patient Showed Pallor.	Count Five Weeks after Operation.
Total red cells	6,570,000	4,070,000	5,620,000
Hæmoglobin value	58.0%	65%	94.0%
Colour index	0.4	0.8	0.8
Total leucocytes	17,200	11,600	9,800
Neutrophile cells	70.5%	62%	45.0%
Lymphocytes	28.0%	31%	43.5%
Eosinophile cells		1%	8.5%
Basophile cells	1.0%	2%	
Large mononuclear cells	0.5%	4%	3.0%
Transitional cells			
Condition of the red cells	Red cells appear normal	Red cells normal	Red cells show a few examples of polychromasia and punctate basophilia. Size and shape normal. No nucleated forms seen.

A search for a focal sepsis was made. An X ray examination of the teeth for apical sepsis revealed sepsis in the upper left first and second bicuspid and in the second molar.

The ear, nose and throat consultant reported that on clinical examination there was no evidence of any sinus disease; the right tonsil contained cheesy material. X ray examination revealed no dulness of the sinuses.

The consultant physician reported that, in his opinion, the case was possibly one of a very chronic grade of streptococcal septicaemia which had produced vascular disease.

A week after the patient's readmission, an operation was performed by me for ligation of the right common iliac artery, by the intraperitoneal route.

The anaesthetic employed was ether given by the open method. Approach was by the intraperitoneal route. An incision was made, extending from 2.5 centimetres (one inch) above the umbilicus in the mid-line to the symphysis pubis. When the abdominal cavity was opened, the peritoneum overlying the right iliac muscle was incised and the caecum was drawn to the mid-line. The pulsating tumour was found to be continuous with the right common iliac artery, leaving little room for ligation above. The right common iliac artery was then doubly ligated with chromicized gut, just proximal to the aneurysm (see Figure 1). Next, the caecum was replaced and the continuity of the peritoneum was restored with sutures of plain catgut. Before the abdomen was closed, the appendix was removed. Finally, the patient's right leg was wrapped in cotton wool and bandaged to insure warmth.

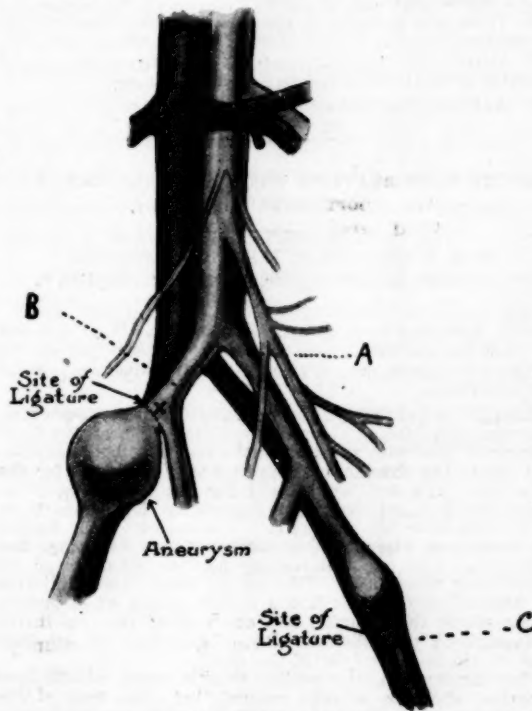


Diagram illustrating ligatures and condition of vessels. A = left common iliac artery; B = right common iliac artery; C = dilatation above the site of the previous ligature. (An error has been made in this drawing. The site of ligature on the right side should be just below the bifurcation of the abdominal aorta and the aneurysm should be shown as extending up into the common iliac artery.)

There was slight dilatation of the left external iliac artery above the site of the ligature of the left femoral artery.

For about a week after operation the patient experienced pain, fairly severe and throbbing in character, situated mainly in the epigastrium and over the area of operation. After operation there was no more pain; a pallor persisted to a marked degree for about three weeks, but the patient's colour improved when he was put out in the sun daily and iron pills were administered. Four weeks after operation the patient felt and looked well, and had no pain whatever. A week later the patient was allowed to get about on crutches, and at the end of the next week he was discharged in excellent health and spirits.

In October, 1931, the patient reported that he was working as a mechanic for an oil company and was quite

well. The only disability that he complained of was that he could not run, as his leg did not seem to be able to move quickly enough.

In sections of the proximal half of the appendix the epithelium was undergoing mucoid change. Sections of the proximal half showed an early newgrowth with the histological appearance of a carcinoma. Newgrowths of the appendix, which have the microscopic structure of a cancer, are often associated with mucocele of the appendix, and usually do not metastasize.

Points Worthy of Note.

The following points are worthy of note:

1. There is a complete absence of any history of syphilis.
2. Absence of any septic infection beyond X ray diagnosis of apical sepsis of the teeth.
3. No history of trauma.
4. Section of the appendix *vermiformis* is reported on by Dr. Keith Inglis.
5. There was a change in the arterial walls, "the arteries resembling veins".
6. Slight dilatation of the left external iliac artery above the site of ligature of the left femoral artery.
7. Anæmia was present.

ACUTE PANCREATITIS WITH NORMAL URINARY DIASTASE.

By R. A. MACDOUGALL, M.B., B.S. (Melbourne),
Resident Medical Officer, Melbourne Hospital.

THE following case of acute pancreatitis is of interest in that at no time, from admission of the patient to hospital to death, was a rise in urinary diastase content demonstrated.

Mrs. J.H., aged fifty years, was admitted to the Melbourne Hospital complaining of upper abdominal pain of five days' duration. The pain radiated to the region of both scapulae, but not to the shoulders. Vomiting was persistent for the first two days, but was absent for the remaining three days, she had suffered from indigestion for some years, this consisted of epigastric discomfort and feeling of distension after meals. She had no vomiting, her discomfort was not relieved by food or alkalis, and no periodicity was noted. Two weeks before her admission to hospital the patient had a severe attack of epigastric pain lasting three hours, and she noticed that the urine was dark on the following day. There was no jaundice, and no change in colour of the stools.

On examination, the patient was a stout, middle-aged woman, showing slight cyanosis of the face. The temperature was 38.4° C. (101.2° F.), and the pulse rate 100. There was impaired percussion note at the right base with diminished vesicular murmur and numerous fine crepitations, and at the left base scattered crepitations. There was slight upper abdominal rigidity, some distension and tenderness over the umbilicus, together with slight tenderness in the right loin and right iliac fossa. The urinary diastase was two units.

At operation, on opening the peritoneal cavity a small amount of blood-stained fluid appeared and numerous small white patches of fat necrosis were seen on the omentum. The pancreas was enlarged and indurated, with a patch of softening at the middle of the body of the pancreas. The gall bladder was thickened and contained numerous small stones. Cholecystostomy and drainage of the lesser omental sac were carried out.

Following the operation, evidence of toxæmia slowly increased, until death occurred fourteen days later.

The urinary diastase content after operation remained at two units for five days; after that it was not estimated every day, but at no time was an estimation higher than five units.

At autopsy, white patches of fat necrosis were seen throughout the peritoneal cavity, most marked round the

pancreas, in the lesser sac, about the hilus of the spleen, and extending down both paracolic gutters into the pelvis. This fat necrosis showed practically no hæmorrhage, but only whitish hard plaques with marked softening suggesting suppuration. The pancreas consisted of one large slough, involving mainly the head and part of the body, while the tail, although showing fat necrosis, still showed many areas of normal tissue. The cause of death was toxæmia resulting from extensive fat necrosis.

In the Baker Institute series of twenty-six cases of acute pancreatitis (*The Australian and New Zealand Journal of Surgery*, October, 1933), the urinary diastase was greater than 50% in all, and ranged as high as 4,100 units. One case is quoted (the patient was admitted after the paper was compiled) in which the urinary diastase was within normal limits before operation. The present report indicates that the diagnosis of acute pancreatitis should not be entirely discarded because the urinary diastase is within normal limits, although such a finding is very unusual.

Acknowledgement.

In conclusion, I should like to thank Dr. W. E. A. Hughes-Jones, honorary surgeon to out-patients, Melbourne Hospital, for permission to publish this case.

Reviews.

THE NURSING OF THE MENTALLY DEFICIENT.

In his book on mental deficiency nursing, Dr. O. P. Napier Pearn has attempted to simplify, but not to replace, the "Manual for Mental Deficiency Nurses".¹ It is not really a synopsis, but it has followed the lines of the latter manual. It contains much of what the author has already written in his book for mental nurses, some of the chapters being almost identical. The process of simplification has detracted much from the lucidity of the original manual without adding to its clarity. Much must be demanded of the nurse who is expected to know the facts expressed in "nearly every separate sentence" in a book of 280 pages.

HISTOLOGY.

SCHAFER'S "Histology" has probably been one of the most popular text books on this subject ever published in the English language, and has been the friend of countless numbers of medical and biological students during the past half century.² It is close on fifty years since the book first appeared and it is a remarkable fact that all but the edition which now appears has been brought out under the editorship of the original author.

No considerable changes have been made since the twelfth edition was published, when the book was thoroughly revised and brought up to date, but the sections on the development of the blood corpuscles and on ossification have been rewritten and a number of illustrations have been replaced by new figures.

The figures still form a very important and prominent feature of the work, and the text is adequate and reliable. There is no doubt that, under its new editorship, the book will still maintain its popularity and usefulness.

¹ "Mental Deficiency Nursing (Simplified)", by O. P. Napier Pearn, M.R.C.S., L.R.C.P., D.P.M.; 1934. London: Baillière, Tindall and Cox. Foolscap 8vo., pp. 256, with illustrations. Price: 5s. 4d. net.

² "Essentials of Histology, Descriptive and Practical, for the Use of Students", by E. Sharpey-Schafer, F.R.S.; Thirteenth Edition, edited by H. M. Carleton, M.A., B.Sc., D.Phil.; 1934. London: Longmans, Green and Company. Demy 8vo., pp. 623, with illustrations. Price: 15s. net.

The Medical Journal of Australia

SATURDAY, NOVEMBER 3, 1934.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

LOBAR PNEUMONIA.

It was natural that the discussion on the principles of the treatment of acute respiratory infections of the lungs, introduced by Dr. S. A. Smith at a recent meeting of the New South Wales Branch of the British Medical Association, should centre round pneumonia. It was also natural and timely that special reference should be made to the different types of pneumococcus and to the use of serum therapy. As Dr. Smith pointed out, relatively little has been done in Australia in regard to the determination of the distribution of the several types of pneumococcus; and the view that the fault is more that of the clinician than of the pathologist may spur the clinician to take his share in a research that is urgently needed. Dr. Smith's paper and that part of the discussion that was not given over to the consideration of minutiae of treatment, dealt with pneumonia as an infective process caused by a virulent microorganism and with the effects of this process on the heart and blood vessels. In the light of this conception treatment is necessarily directed towards destroying the microorganism or checking its activities, neutralizing its toxins and

increasing the resistance of the patient. There is another conception of pneumonia that visualizes in the process a mechanical element. This view has been advanced by American writers, chief among whom are Coryllos and Birnbaum. These writers hold that pneumonia is a form of atelectasis of the lung. Pneumonic infection of the bronchial tree, in their opinion, is not by itself sufficient to cause lobar pneumonia. In addition to the presence of the pneumococcus another factor is necessary, and this factor is the occlusion of a bronchus by a pneumonic exudate. They hold that the laws governing massive atelectasis also govern pneumonic atelectasis. For purely mechanical reasons pneumonic atelectasis occurs more frequently in the lower lobes of the lungs and most often on the right side. If a large bronchus is occluded, lobar pneumonia results; if several smaller bronchi are involved, bronchopneumonia will follow.

Without discussing this conception in greater detail, one may conclude that atelectasis is a factor in pneumonia. Different opinions will, of course, be held as to its importance. Coryllos and Birnbaum and those of their school of thought are logical in their views on treatment and have suggested that efforts should be made by aspiration with the bronchoscope to remove the exudate. This heroic measure, though advocated four or five years ago, has not been adopted. Of greater interest, however, is the preventive and curative treatment of pneumonia by the inhalation of 5% carbon dioxide, advocated by Coryllos, Birnbaum, Henderson and Haggard. They believe that by the increased respiration caused in this way plugging of a bronchus will be prevented. The conditions for which they recommended this preventive measure were pneumonia in the newborn, post-operative pneumonia and pneumonia after such conditions as carbon monoxide poisoning. They also, after animal experiments, used the inhalation of carbon dioxide in the treatment of lobar pneumonia in man and claimed satisfactory results.

The views of what we may call the atelectasists have been previously discussed in detail in this journal; on this occasion merely the outlines of their work has been given. It is interesting to com-

pare their method of treatment with the newer suggestion that the pneumonic lung should be brought to rest by means of artificial pneumothorax. This is, of course, directly opposed to the Coryllos-Birnbaum treatment. Artificial pneumothorax would give rest to the inflamed lung; carbon dioxide inhalation means activity. If the choice of one of these two methods were imperative, artificial pneumothorax would probably be chosen on the general abstract principle of giving rest to an inflamed organ. But though further investigation may show artificial pneumothorax to be useful, it does not at present appear that either method is necessary. If the bronchi could be kept patent at the onset of a respiratory illness, pneumonia would most likely not occur; it would be difficult to imagine a lobar pneumonia in which the bronchi were not occluded. Of course, if carbon dioxide were used in the early stages of an acute respiratory illness and pneumonia did not follow, the credit could not be definitely given to the carbon dioxide alone. The use of carbon dioxide as described by Dr. Smith and other speakers at the Sydney meeting is in a somewhat different category; anoxæmia and the failure of the peripheral circulation have been dealt with by them at such length that it is unnecessary to pursue this aspect of the subject further. The conclusion of the whole matter is that treatment must be based on general principles, and in this regard emphasis must be laid on the urgent need for further investigation into serum treatment so that its sphere of usefulness may be extended and so that it may be made more generally available.

Current Comment.

PLEURAL ABSORPTION.

EMPHYEMA is always a serious complication of pneumonia, but it is well known that the prognosis varies with the organism concerned and also with the way in which the pleural inflammation is related to the parent disease. Thus the empyema occurring after the crisis, usually pneumococcal in type, is often relatively benign, whereas pneumonia complicated by a simultaneously occurring empyema, the so-called syn-pneumonic variety, is apt to be attended by a high mortality. The danger in the latter type lies in part in the infecting organism, not seldom a streptococcus; but this is not the

whole story, for it would seem likely that any mechanical or vital factors governing pleural absorption must also be of great importance. It is recognized that when a purulent exudate is discovered in the course of a pneumonia, repeated aspiration is indicated, and that drainage should not be immediately carried out by open operation. Either this is deferred until there are pleural adhesions that will prevent dangerous movement of the mediastinum; or, if more thorough drainage is decided upon, some closed form is adopted. But it will be evident that we do need some definite information on the subject of the capacity of the pleura to absorb the toxic products of bacterial action, for upon correct physiological and pathological teaching must all scientific treatment depend. Such information is supplied in an article by R. C. Brock, based largely on experimental work.¹

Brock first points out that the absorptive capacity of the pleura for particulate matter like carmine, graphite, or bacteria has been found by various observers to be of a high order. Particles absorbed from the pleura appear in the venous circulation within an hour, and there is reason to believe that the lymphatics play an important part in the first stage of the process. Brock remarks that it may be safely assumed, therefore, that absorption of bacteria and also of their products occurs, and that this is distinctly harmful; further, that the greater the surface available, the greater the degree of resulting toxæmia. Since the fluid making up a pleural exudate may be highly toxic, it is of great interest to determine the factors underlying fluid absorption from the pleural membrane, yet this subject has been neglected for many years. We require to know first what influences the absorption rate from the normal uninflamed pleura, and next how this is modified, if at all, when the membrane is inflamed, and when there is also air in the pleural cavity, causing additional collapse of the lung. The normal pleura absorbs fluid at a rate corresponding to the volume of fluid present and the depth of the respiratory movements. Brock has demonstrated strikingly the importance of the chest movements by introducing a poison, such as strychnine, into the pleural cavity of laboratory animals, whose survival period was greatly decreased by inducing deeper respiratory movements by the use of carbon dioxide or by partly occluding the trachea. The extension of these experiments to the inflamed pleura showed that a state of inflammation augmented the rate of absorption considerably. By injecting a small quantity of turpentine into the pleura an intense exudative pleurisy is produced, and after aspiration of the fluid exudate the introduction of a rapid poison like strychnine gives an exact measure of the speed of absorption. It was found in certain experiments that an animal would survive only one-third of the usual period if the pleura were inflamed before the observation was begun. The significance of this finding will be

¹ *The British Journal of Surgery*, April, 1934.

evident. As Brock remarks, the patient who is grossly dyspnoic and perhaps cyanosed is absorbing the toxic products of a suppurative pleurisy at an alarming rate and may thus kill himself as surely as will the laboratory animal poison itself with the strychnine in its pleura. Investigation into the effect of air in the pleural cavity revealed that the addition of air to fluid did not diminish the absorption rate, as was at first expected, but rather doubled it. Absorption was found to occur more rapidly from a hydropneumothorax than from a simple hydrothorax, and more rapidly still where dyspnoea was present. Brock finds this effect of air somewhat surprising, but if the results can be applied to the human subject, they are full of interest, and incidentally confirm the feeling of many clinicians that in the case of a simple pleural effusion it is of advantage to introduce more or less air when tapping is performed.

But we are at the moment more concerned with the bearing of this problem on highly toxic and purulent effusions. Of course, Brock's work does not take into consideration all the factors related to pleural effusions, such as their solid content and molecular composition. Nevertheless the general principles may be adopted as logical and sound: that the degree of toxic absorption from the pleural cavity will depend upon the amount of the effusion, the extent of the inflammatory disturbance, and the depth of the respiratory movements. Brock points out clearly that it is in the early stage of a pneumonia, when purulent fluid may be forming, that it is important to take action. The patient is desperately ill, his accessory muscles are fighting hard, he is anoxicemic, and he is absorbing toxic products rapidly. Aspiration should be performed immediately the presence of purulent fluid is discovered, and should be repeated at frequent intervals. Air replacement should not be practised in the case of highly toxic exudates; at least, any air introduced should be considerably less than the volume of fluid removed. It often happens that fear is expressed that aspiration of the chest of an enfeebled patient may do harm; rather should we envisage the harm that may result if purulent fluid be allowed to remain in contact with a membrane that is rapidly absorbing it. The practical suggestion of Tudor Edwards is referred to in this paper and is worth mention in conclusion. He recommends that when repeated aspiration is necessary in a patient who is critically ill, a small incision can be made in the chosen interspace, and through this the needle may be subsequently introduced even twice daily, if necessary, without undue disturbance.

LEPROSY.

THE exact conditions necessary for the transmission of leprosy are not clearly understood. There are certain apparent anomalies requiring explanation. For example: intimate and prolonged contact is said to be the main factor; but conjugal infection is comparatively rare. The problem has

been discussed recently by E. Muir and K. R. Chatterji.¹ Briefly, their hypotheses are as follows: (i) Most healthy adults possess natural resistance to leprosy; (ii) resistance is enhanced by subliminal infections; (iii) resistance is low in early childhood and is lowered in adults or children by debility and by hyperinfection with the *Mycobacterium lepræ*. They base their views on family histories, an extensive clinical experience, and the results of tests with leprolin. Leprolin is a sterilized suspension of ground-up leproma, containing large numbers of Hansen's bacilli. This is known as Hansen's leprolin; a similar suspension made from the spleen and liver of a leprotic rat contains Stefansky's bacilli, and is known as Stefansky's leprolin. Standardized suspensions are used. The intradermal injection of either Hansen's or Stefansky's leprolin in a healthy adult causes the development of an erythematous indurated nodule, which is measured at the end of the third week after injection. In persons who have received subliminal infections the reaction to Hansen's leprolin is enhanced, while the reaction to Stefansky's leprolin is unaltered. When there has been hyperinfection the reaction to Hansen's leprolin is diminished and may be absent. In young children and debilitated people the reaction to both types of leprolin is reduced and may be absent. The results of leprolin tests agree with clinical findings. Muir and Chatterji believe that the extent of reaction to the test is a true index of the patient's powers of resistance. When there is a strong reaction (and this may occur even when lesions of leprosy are present) the patient's resistance is high; when there is a weak reaction or no reaction, the patient's resistance is low. This emphasizes the susceptibility of children. Muir and Chatterji point out that, on the basis of an arbitrary standard, four degrees of infection cause infectious leprosy and three degrees non-infectious leprosy in healthy adults; three degrees produce infectious leprosy in debilitated adults; one degree produces non-infectious leprosy in healthy, or infectious in debilitated children; two degrees produce infectious leprosy in healthy children. Muir and Chatterji reproduce family trees to show how infections of children may occur in leper families through several generations. The important feature is that the child who, within the first few years of life, comes into close and prolonged contact with infectious leprosy acquires the disease, generally in the cutaneous and infectious form, and transmits it to the next generation. Muir and Chatterji state:

... there is reason to believe that if in any community all infectious cases could be effectively isolated from children under 10 years of age, leprosy would disappear from that community in one, or at most in two, generations.

Muir and Chatterji have made a valuable contribution to the knowledge of leprosy. The isolation that they suggest would be impracticable in most places, would be of doubtful humanity, and, if Molesworth's views are correct, would not tend to enhance the powers of resistance of the community.

¹ The Indian Medical Gazette, September, 1934.

Abstracts from Current Medical Literature.

DERMATOLOGY.

Kraurosis, Leucoplakia and Pruritus Vulvæ.

H. MONTGOMERY, V. S. COUNSELLER AND W. MCK. CRAIG (*Archives of Dermatology and Syphilology*, July, 1934) discuss the question of resection of the sensory nerves of the perineum in cases of kraurosis, leucoplakia and pruritus vulvæ. This is especially concerned with the correlation of the clinical and pathological pictures. The diagnosis is discussed and it is important to distinguish the three conditions which may, however, merge into one or another. Kraurosis is an atrophic change which may lead to malignant changes. Leucoplakia is a hypertrophic process, definitely a precancerous dermatosis. Pruritus with lichenification is a benign form of inflammatory dermatosis which, *per se*, does not result in malignant change. These conditions should be distinguished from other forms of dermatosis of the vulva. Epithelioma *in situ* is a contraindication to resection of the perineal nerves. Resection of the nerves is also to be avoided in the presence of psychoneurosis. Even vulvectomy in these cases will be attended with many failures. Resection of the pudendal nerves in all conditions other than specific forms of dermatosis or malignant change of the vulva is the operation of choice rather than vulvectomy for younger women before the menopause or after artificial menopause. Treatment with radium or X rays in cases of persistent pruritus vulvæ due to any of the three conditions mentioned above usually results in only temporary relief and may lead to actinodermatitis.

Treatment of Resistant Somatic Syphilis.

C. C. DENNIE AND W. L. MCBRIDE (*Archives of Dermatology and Syphilology*, July, 1934) hold that failure of somatic syphilis to respond to the routine therapy of arsenic, bismuth and mercury preparations is not due to their inefficiency, but to the failure of the defence mechanism of the body, specially to failure of the reticulo-endothelial system. The defence units of this system, which includes the macrophages, plasmocytes and lymphocytes, have lost the power of being stimulated, which is often restored only by the administration of malaria, heat therapy or typhoid vaccine. The authors state that the efficiency of these forms of treatment is in the order named, heat being only an activating factor. Malaria enhances the value of subsequent treatment, but if the malaria is used too soon it may precipitate the original condition. For these reasons they advise the use of malarial therapy in

the treatment of resistant somatic syphilis, especially in the quiescent stage, providing there are no contraindications. It is held that recurrences will occur if treatment is not persisted in after the administration of malaria.

A Rare Sweat Gland Tumour.

R. L. SUTTON (*Archives of Dermatology and Syphilology*, August, 1934) describes an unusual case presenting discrete nodules occurring unilaterally on the neck of a woman of forty-five years. Histological examination led to the diagnosis of a rare form of tumour of the sweat glands. The origin from the sweat glands was postulated on the observations that the tumour was of two-layered epithelial cylinder structure and that less highly evolved nodules of syringoma occur at the periphery of larger nodules. The basic scheme of the nodule in this case is the secretory tubule surrounded by neoplastic proliferation of sheath cells. It is supposed that a sudoriferous neoplasm, with the growth urge emphasized on the secretory cell layer, produces the classic syringocyst adenoma, while if sheath cells are predominantly active, then firmer, larger nodular growths occur, as seen in this case and in that of Paul and Adamson. The case described is an instance of tumour of the sweat glands, microscopically cystic and alveolar in structure, and clinically nodular in appearance. It is properly named *syringocystadenoma nodularis*.

Orange Dermatitis.

J. AVIT-SCOTT (*The British Journal of Dermatology and Syphilis*, August-September, 1934) reports the case of a woman who for seven years suffered from a dermatitis of the hands. She had all the usual forms of treatment, including X rays. She was in the habit of peeling and eating an orange at night, after which, at 2 a.m., her hands became irritable and swollen and scaly. On ceasing to handle oranges her fingers became normal. This reaction was checked on several occasions after the hands recovered.

Psychotherapy in the Treatment of the Asthma-Eczema-Prurigo Complex in Children.

C. H. ROGERSON (*The British Journal of Dermatology and Syphilis*, August-September, 1934) describes the treatment by means of psychotherapy of a number of cases of prurigo in children between the ages of two and a half years and twelve years. The psychotherapy is chiefly applied to the parents of the child. It was noted how the children improved on being sent to a convalescent hospital away from their home influences. On investigating the home conditions it was found that most patients had anxious, irritable and fussy parents and that the children were often overprotected and not allowed sufficient contact with other children of their

own age. By rectifying as far as possible the undesirable aspects of their upbringing, treatment in most of the cases reported produced excellent results. Treatment by medicines and ointments was gradually discontinued.

UROLOGY.

Gangrene of the Bladder.

W. C. STIRLING AND G. A. HOPKINS (*Journal of Urology*, April, 1934) have reviewed 207 cases of gangrene of the bladder and present the reports of two further cases. They believe that the condition is more common than has been suspected and should be considered in all cases of severe chronic cystitis. The chief predisposing factors are infection and retention of urine. In the female palliative treatment may be tried, as fragments may pass through the wide urethra. In the male early cystostomy offers the best chance. If instituted early, treatment may result favourably, even in the presence of severe necrosis.

Primary Tumours of the Renal Pelvis.

G. NICOLICH (*Zeitschrift für Urologie*, February, 1934) discusses five cases of renal pelvis tumours. It is generally accepted that, whether such tumours are innocent or malignant, removal of the whole ureter, together with the kidney, is indicated. Since this is a severe procedure, however, operation should be limited to simple nephrectomy in very old or very debilitated patients. The surgeon should, in such a case, be continually on the look-out for recurrence of hæmaturia; in one of the author's cases this recurrence of hæmaturia did not manifest itself until three years after the nephrectomy. Secondary ureterectomy is then necessary, though, in dangerously ill patients, one should first look for and coagulate any papillomata which may be in the bladder or at the lower end of the ureter, in the hope that they are the sole cause of the hæmorrhage.

Hyperparathyroidism and Renal Calculus.

SIXTEEN cases of hyperparathyroidism in which operation has been performed at the Massachusetts General Hospital proved histologically to be due to adenoma or glandular hyperplasia. The condition is said to be due to the excessive secretion of parathormone, which has a profound influence on the metabolism of calcium and phosphorus in the body. Richard Chute (*New England Journal of Medicine*, June 14, 1934) records the presence of urinary calculi in twelve of the sixteen cases and attributes this incidence to the excessive excretion of calcium and phosphorus in the urine, which therefore tends to precipitate solid calcium phosphate. Calculi formed in such a manner tend to be multiple, bilateral and recurrent. Cases have been observed radio-

graphically in the act of forming calcium deposits in the renal tubules over a period of years, and an excellent case of "microlithiasis" is illustrated. The symptoms of the condition are not always prominent and may escape notice until some accident draws attention to them. Lassitude, generalized aches in bones and joints, weakness of the legs, loss of weight, polyuria and polydipsia may be found, but fundamentally the diagnosis rests on the presence of a high serum calcium. Any finding above 11.5 milligrammes is said to be very suggestive (normal is 10 milligrammes per 100 cubic centimetres of blood). In addition, the blood phosphorus content is usually, but not invariably, lowered. Treatment consists in the localization and removal of the offending tumour. Those patients so treated have been observed to show normal serum calcium and phosphorus and in no case has urinary stone occurred thereafter.

Actinomycosis of the Kidney.

H. SCHNEIDER (*Zeitschrift für Urologie*, February, 1934) describes a case of solitary actinomycosis of the kidney in which no other organ or part of the body was affected and no portal of entrance for the ray fungus was discoverable. It was considered that the fungus reached the kidney by the blood stream. The ray fungus can develop for a long time in the renal parenchyma without breaking into the pelvis. Even when such eruption occurs, the excretory portions of the urinary tract may remain unaffected, though the fungus is being passed in the urine. The disease favours the development of renal calculi. Trauma or, as in the author's case, an operative intervention on the kidney, may cause a flaring up of a hitherto completely inactive actinomycotic tumour.

Excretory Urography in Infants and Children.

M. F. CAMPBELL (*Journal of Urology*, July, 1934) records his observations on 304 cases involving examination of 1,900 films. The method has not come up to expectations, as in the most favourable circumstances only two-thirds are of diagnostic value, while in unfavourable circumstances they are valueless. Contrary to general medical opinion, intravenous urography is not the final source of urological information in the very young. The author believes that in every case showing an abnormality cystoscopy should be performed, and this was done in all but 36 of his own cases. He has performed simultaneous bilateral pyelography in girls of three months and boys of ten months, and inspection cystoscopy in a boy only ten days old. The technique is given in detail and it is emphasized that the most important single factor is the patience and skill of the radiographer. Campbell does not consider that any intravenous urogram alone justifies operation, but demands the completion

of the investigation. At the same time the method often provides invaluable information in conjunction with other methods.

Torsion of the Spermatic Cord and Epididymitis.

D. T. PREHN (*Journal of Urology*, August, 1934) discusses the incidence and symptoms of torsion of the spermatic cord. He has observed in his own cases and in the descriptions of cases from the literature that whereas rest and elevation of the scrotum invariably relieve the pain of epididymitis, that due to torsion of the cord is increased by this measure. This is designated the "Pohn sign". He further concludes that, although many possible factors have been considered, no definite predisposing or exciting causes can be held responsible for this condition; but the majority of cases occur before the age of twenty years and about half in imperfectly descended testes.

Diagnosis of Testicular Tumours.

ACCURATE diagnosis of scrotal swellings has been greatly facilitated by the use of the Zondek test. R. B. Henline (*Journal of Urology*, August, 1934) points out that the presence of prolan A in the urine is diagnostic of the malignancy of the condition. The pathological type of tumour may be determined before operation by the quantitative estimation of prolan A excretion. The effect of irradiation on the quantity of prolan A excretion determines the radio-sensitivity of the tumour; similarly, after effective treatment, the reappearance of the anterior hypophyseal sex hormone in the urine indicates the presence of recurrence or metastasis. A case of bilateral fibroma testis in which calcification has occurred is described. The Zondek test in this case gave no reaction.

Gross Infarct of the Kidney.

D. N. EISENDRATH (*Journal d'Urologie*, January, 1934) describes a case of gross renal infarct and reviews thirty cases which he has been able to collect in medical literature. The most constant symptoms are pain, hæmaturia, oliguria and albuminuria. Less constant symptoms are the presence of a mass in the kidney region, fever, rigors, vomiting and other general signs of grave intoxication. Anuria is found particularly when gross infarcts are bilateral. In cases in which one has found signs of a cardiac lesion, atheroma of the aorta, obliterative endarteritis or phlebitis, also in certain infectious diseases, one should think of gross renal infarct if pain is localized to the renal area on one or both sides, particularly if the pain is accompanied by hæmaturia and oliguria. One must exclude renal colic due to some obstruction; in the latter event the pain tends to be intermittent and to radiate instead of being continuous and localized. Urological diagnostic measures, including intra-

venous urography, are used to localize the trouble and to help in exact diagnosis. Where one kidney is grossly affected and the opposite organ functions well, urgent nephrectomy is the indication. Decapsulation is indicated only when the kidney is the seat of small infarcts.

Non-Specific Prostatitis.

R. L. SMITH (*Urologic and Cutaneous Review*, July, 1934), from a study of his own cases, suggests that non-specific prostatitis may originate during a previous illness associated with fever. He believes that the generalized diminution of body fluids in diseases associated with a high temperature may cause some precipitation in the prostate and vesicles which leads to interference with drainage of the genital tract. "If this is true, the delicate muscle surrounding the tubule may become atonic, pressure within the tubule increase and prostatitis occur. This pressure . . . may continue to a degree sufficient to cause liquefaction necrosis, especially in those cases in which calcified amyloid concretions are found".

Extrophy of the Bladder.

G. MARION (*Journal d'Urologie*, May, 1934) proposes a new operation for the cure of extrophy of the bladder both in girls and boys. It is usually better to delay operation until the child is at least ten years of age. This method is designed to give a continent as well as a closed bladder. In the female a curved trocar is made to tunnel its way from the anterior portion of the vulva to emerge on the bladder floor behind the inter-ureteric bar. An open-ended de Pezzer drain is drawn through the newly-formed tunnel and fixed so that the mushroom-shaped end lies on the floor of the bladder. Around the terminal portion of the shaft of the de Pezzer drain is fixed a sheath of fine skin taken from the hairless part at the side of the tendo Achillis. This graft is used in order to hasten epidermization of the new urethral tunnel. The posterior wall of the bladder is then dissected up from the abdominal wall, freed as much as possible, and closed around another de Pezzer drain. After necessary plastic arrangements are made, the muscular, aponeurotic and cutaneous layers are sutured over the newly formed bladder. A special method of removing and changing the urethral drain is described, and particular insistence is laid on the necessity for dilatation of the new urethral canal for some time afterwards. In boys the technique is identical, except that the new urethra runs down to the perineum. In dissecting up the posterior wall of the bladder, the incision passes above the *colliculus seminalis*, so that the genital tract is separated from the urinary. Later on, the penile urethral channel is closed by a plastic operation, so that the real urethra now serves only for ejaculation.

Special Articles on Treatment.

(Contributed by request.)

XLII.

FISSURE IN ANO, FISTULA IN ANO, SUPPURATION IN THE ANAL AND RECTAL REGIONS.

FISTULA IN ANO and fissure in ano in themselves are small entities, but they are amongst the most distressing complaints with which humans can be afflicted. As *fistula in ano* is frequently the after-result of abscess in the rectal and anal regions, it is convenient to discuss the three conditions at the one sitting.

The anatomy of the rectum and anal canal has always been a difficult study with students and, as many readers no doubt have long passed beyond the portals of anatomy, it will probably not be out of place to mention a few salient anatomical points concerning the anal canal and lower part of the rectum.

The rectum lies wholly within the pelvis and its peritoneal reflection is but 7.5 centimetres (three inches) from the anal margin.

The rectum ends below in the anal canal, which is about 2.5 centimetres (one inch) long. The circular fibres of the rectum encircle the anal canal at its upper limit, forming the internal sphincter, while the external sphincter (a subcutaneous muscle) encircles the anal orifice.

The *levator ani* and coccygeal muscles form the pelvic floor or diaphragm, are covered with pelvic fascia and help to support the bowel. The fibres of the *levator ani* arising from the pubic bone on contraction firmly grip the anal canal and therefore tend to form an additional sphincter.

The whole area is richly supplied with nerves, arteries and veins; thus, when this area is inflamed, unbridled licence is given to Nature to cause much congestion, pain and discomfort.

There are about nine vertical folds of mucous membrane and *muscularis mucosæ* in the anal canal; they are permanent throughout life. Their bases are connected by an irregular line just above the anus, and between them are small depressions, known as the rectal sinuses of Morgagni, which below are guarded by minute anal valves. As will be noted later, it is in these depressions that infection often starts and that one of the anal valves is responsible for the presence of the sentinel pile in fissure in ano.

Fissure in Ano.

Fissure in ano, or anal fissure, is an elongated ulcer in the long axis of the lining membrane of the anal canal lying superficial to the external sphincter muscle of the anal canal. It is met with mainly in adult life, and constipation is the usual predisposing cause, a condition further aggravated by the fear of pain on defecation. The hard, scybalous mass actually tears the skin of the anal canal and healing is prevented by the stretching at defecation and the constant action of the underlying external sphincter muscle.

Fissure is usually single, but there may be several fissures, and examination with the patient in the knee-elbow position will generally reveal the fissure lying between the normal rugæ of the anal canal. Occasionally a small tag of skin, generally one of the anal valves which has been pushed downwards towards the anus, hides the fissure externally and is known as a "sentinel pile". In a deep fissure the external sphincter lies bared at its base.

Intense tearing pain during and for some time after defecation is the characteristic symptom of fissure and, as can be well understood, the degree of pain varies with the depth of the fissure. Slight hæmorrhage may occur at defecation, though this is rare, but the pus escaping from the raw surface often causes *pruritus ani*.

If the fissure is recent and superficial, palliative measures should first be tried. Constipation should be treated and, if necessary, some emollient inserted into the bowel before

defecation to soften the fæces. Cocaine ointment applied before defecation gives great relief. Very soft paper or cotton wool should be used to clean the part after every bowel action.

If the fissure has penetrated deeply, operation alone holds out hope of cure, and the main objective of operation is to put the external sphincter muscle out of action by stretching or incision through it at the base of the fissure.

In addition, excision of the fissure and the skin immediately outside the anus for about 1.25 centimetres (half an inch) should be done, the cut edges stitched together by fine catgut, and the anal canal then plugged for twelve to twenty-four hours with iodoform gauze saturated with vaseline to prevent oozing into the rectum and hematoma formation.

The wound should be kept clean by swabbing twice daily, certainly after each bowel action, with wool soaked in boracic acid solution; it should be dried and then dusted with some mild antiseptic powder, preferably with iodoform powder, if there be no idiosyncrasy.

Control of the external sphincter will be gradually regained, and by ten days the patient should be up and about, and by a fortnight well enough to leave hospital.

The patient should report every week for examination to be sure that healing has taken place and that there is no tendency to undue contraction of the orifice. Above all constipation must be avoided.

Fistula in Ano.

Fistula in ano is a suppurating track opening both into the bowel and cutaneous surface, though three forms are described: (i) blind internal fistula, (ii) blind external fistula, (iii) complete fistula.

Blind internal fistula is a track or pouch lined with granulating tissue discharging into the lower rectum or anus.

Blind external fistula is similar to the above, but opening on to the skin near the anus and having no connexion with or opening into the bowel.

Complete Fistula in Ano.

Complete *fistula in ano* is a suppurating track opening both into the bowel and on to the cutaneous surface. It would be more correct to name the first mentioned as rectal and cutaneous sinuses respectively.

For a comprehensive study of *fistula in ano* the reader is referred to an article of some magnitude by Ernest Miles in *The Proceedings of the Royal Society of Medicine*, Volume XXV, 1931 to 1932, pages 1649-1678.

Complete *fistula in ano* may be described as: (i) superficial, (ii) intermuscular, (iii) supramuscular.

Superficial Fistula.—The superficial fistula opens between the skin and anal canal and sometimes communicates with the base of a fissure and generally is no more than 2.5 to 3.75 centimetres (one to one and a half inches) long. It generally lies superficial to the external sphincter muscle, but may pierce some of its fibres. The treatment is by excision.

Intermuscular Fistula.—Intermuscular fistula generally results from an ischio-rectal abscess. The internal opening lies between the internal and external sphincters, a constant and weak spot in this part of the rectum, and the track passes through their fibres.

The external opening at first is single. Imperfect drainage leads to burrowing, multiple track formation and multiple openings on the skin. The track may burrow to both sides of the middle line from one ischio-rectal fossa to another, sometimes taking the shape of a horseshoe, with an opening on either side of the anus, but with only one opening into the bowel.

The symptoms vary. Often flatus is passed, fæces rarely, but the discharge persists and abscesses tend to form and reform, needing frequent operations for relief and leading to excessive scarring and destruction of fatty tissue.

The treatment is essentially operative. The opening into the bowel should be carefully traced and the tract excised, and with it all associated hard fibrous tissue.

Endeavour should be made to reach the plane of healthy fat and pliable tissue, when healing will be found to

take place more readily. Should complete removal of the fistulous tract or tracts be impossible, they must be slit up. In every case healing must be encouraged by granulation from the bottom of the wound.

In dissecting out an intermuscular fistula it will generally be necessary to cut through the external sphincter, and this must be done in one place only and transversely to the axis of its fibres. The sphincter will generally recover from this.

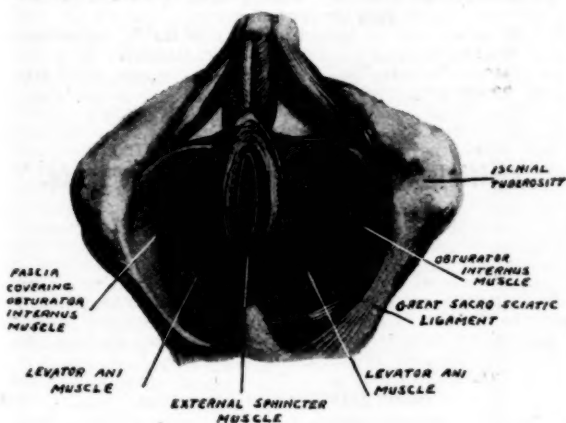


FIGURE I.

Should the tract extend above the internal sphincter, in no circumstances must this muscle, as well as the external sphincter, be cut through, as experience has shown the risk of incontinence of faeces to be too great. In such cases the fistulous track should be excised as high as possible, and the remaining portion curetted. The opening into the bowel should be excised and closed with catgut. The tract left should be packed lightly with gauze, syringed regularly (two or three times daily) with some weak antiseptic lotion and repacked. With constant care and nursing it will generally be enticed to heal.

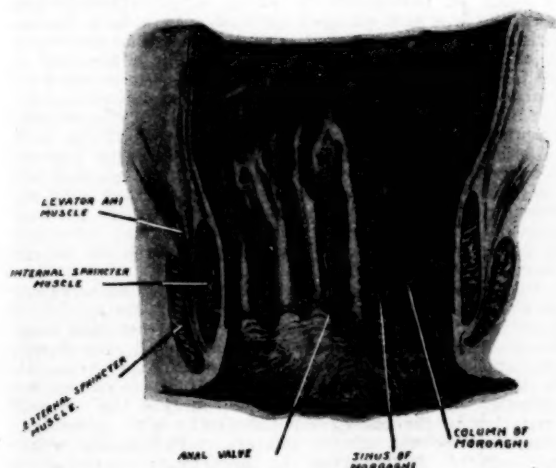


FIGURE II.

Supramuscular Fistula.—Supramuscular fistulae are fortunately comparatively rare. They burrow through the bowel wall above the internal sphincter. They generally arise from rectal ulceration, from a pelvi-rectal abscess and occasionally from the bursting upwards of an ischio-rectal abscess through the levator ani muscle and then into the bowel.

Attention to the diagrams will show that an attempt at excision or splitting up of the whole tract of a supra-muscular fistula would involve injury to both sphincters and inevitable incontinence therefrom.

If the origin of such a fistula is inflammatory, excision of as much as possible should be undertaken, the inaccessible portion should be syringed and kept clean by constant attention to promote healing from its deepest part.

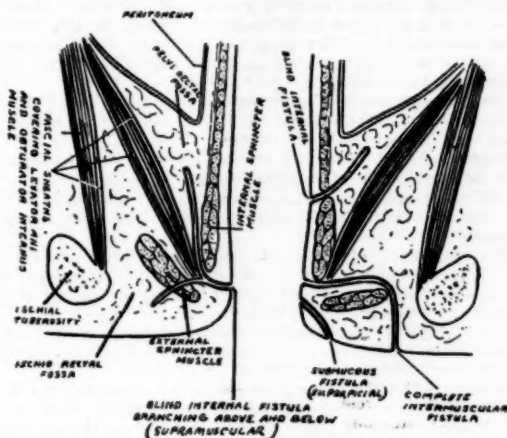


FIGURE III.

When the fistula is due to malignant disease, stricture, tuberculous or syphilitic or intractable ulceration of the bowel, a more radical bowel operation will be indicated or just a colostomy to relieve distress.

Blind internal and blind external fistulae should be converted into complete fistulae and treated as such by excision when possible.

After operations for fistulae the patient should be rested in bed till all deep healing has taken place.

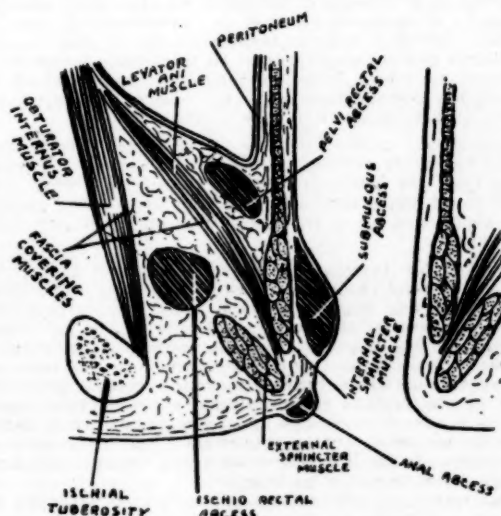


FIGURE IV.

Suppuration in the Rectal and Anal Regions.

Suppuration in the rectal and anal regions, for convenience, are divided into: (i) subcutaneous or peri-anal, (ii) ischio-rectal, (iii) submucous, (iv) pelvi-rectal, (v) labial.

Subcutaneous Abscess.—Subcutaneous abscess arises from an infected sebaceous skin follicle, pile or fissure, and causes burning, itching at the anus and pain on defecation, and is treated by incision, light packing, fomentations and, above all, constant attention to cleanliness.

Ischio-Rectal Abscess.—Ischio-rectal abscess generally arises from some infected area of the lower part of the rectum, but may follow infection of a hæmatoma from injury, from spread from peri-anal suppuration, from a piece of fish or meat bone becoming stuck in one of the rectal sinuses and working its way through, from suppuration above a rectal or anal stricture and sometimes from a focus of tuberculosis.

Ischio-rectal abscess manifests itself with pain in the perineum and at the anus; a brawny swelling develops, which can be palpated *per rectum*.

If not operated upon, the pus bursts into the rectum and later becomes a blind internal fistula or may burst on to the skin, becoming a blind external fistula, or may break through both skin and rectal surfaces, and then form a complete fistula.

The treatment of such an abscess is by free incision, the incision being of a T- or cross-shape, avoiding the sphincter muscles carefully and breaking down all loculi of pus and allowing for free drainage.

As the majority of these abscesses arise from a breach of the lining membrane of the lower part of the rectum, a complete fistula supervenes in most cases.

After incision the wound should be well cleaned out with some weak antiseptic lotion and packed lightly with gauze and fomentations applied every four hours till acute inflammation and pain have subsided. This treatment in some cases can be augmented by hot saline rectal douches given by a soft rubber catheter from a douche can. Morphine may be necessary. The part should be thoroughly cleaned after each bowel action, repacked with gauze and encouraged to heal from the bottom. By these means fistula formation may be averted, but if this is inevitable, it is better to let the acute inflammation subside, the tissues sclerose and at some not distant date carry out complete excision.

Tuberculous Ischio-Rectal Abscess.—Tuberculous ischio-rectal abscess comes on insidiously in patients as a rule suffering from phthisis, but there may be tuberculous infection in an abscess occurring in an apparently healthy person. It generally causes no inconvenience (till it bursts), though it may be responsible for an obscure and persistent rise in temperature. An intractable fistula with supervening mixed infection generally results, which is conspicuous for its chronicity. The treatment is the same as for all fistulae, but it is rarely cured.

Submucous Labial Fistula.—Submucous fistulae and labial fistulae (occurring in the *labium majus*) generally arise from the lower part of the rectum and, when possible are dissected out; otherwise they are slit up, packed, and kept clean, as in all other types, and generally clear up rapidly.

Pelvi-Rectal Abscess.—Pelvi-rectal abscess is a suppurative cellulitis of the connective tissue between the *levator ani* muscle and peritoneum, and most frequently arises round the neck of the bladder and prostate, though sometimes from the upper part of the rectum. It may cause marked constitutional symptoms, and can be felt *per rectum* as a unilateral fullness above the internal sphincter. If it bursts into the peritoneal cavity, acute (fatal) peritonitis is almost inevitable, but more frequently it bursts into the rectum or on the skin surface and gives relief of symptoms. It has been known to track through the sacro-sciatic foramen to the buttock.

The treatment will depend on the cause. It must be opened and drained. If malignant disease is the cause, the chance of cure is hopeless. When it is associated with sigmoiditis, nothing short of a radical operation will give relief.

An important question arises in all these cases: when should the bowels be opened? Forty-eight hours at the most need elapse, when an ounce of castor oil should be given and afterwards a regular daily action induced. The anal region has a natural resistance to faecal matter, and

more harm can come to the individual from a loaded rectum than from a thorough and regular bowel cleansing.

As for anaesthesia, ether or gas and oxygen may be used for general purposes, and low spinal anaesthesia otherwise. In the presence of infection local infiltration is inadvisable.

And finally a note of warning must be given that with the simplest of the conditions above described, unexpected malignant disease, as a separate entity, is sometimes found, and the medical attendant must ever keep this in mind.

HOWARD BULLOCK,

M.B. (Sydney), F.R.C.S. (England),
B.Sc. (Oxon),

Honorary Surgeon, Sydney Hospital;
Honorary Surgeon, The Prince Henry
Hospital, Sydney.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held on July 26, 1934, at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, DR. A. J. COLLINS, the President, in the chair.

Acute Infections of the Lungs.

DR. S. A. SMITH gave an address entitled: "The Principles of Treatment of Acute Infections of the Lungs" (see page 567).

DR. LAURENCE HUGHES said that he intended to confine his remarks to acute respiratory disease in children. He had no experience of the use of serum in the treatment of pneumonia in children. The typing of the pneumococcus would be more difficult than in adults, owing to the fact that it was not easy to obtain sputum in young children. In later childhood pneumonia was a comparatively benign disease.

Dr. Hughes was interested to hear Dr. Smith speak so convincingly of "Carbogen"; he thought that the advantage of the use of carbon dioxide with oxygen in the majority of cases of pneumonia in which oxygen therapy was indicated was still an open question. Personally he was for the most part satisfied with the use of oxygen alone in children, and he would like to put in a plea for its earlier use in many cases of pneumonia. He stressed the beneficial effect that it had, not only on the circulation, but also on the nervous manifestations which were often prominent in children. He thought the use of the nasal catheter was a satisfactory method in children and did not agree with Dr. Smith that the funnel method was altogether futile, provided the flow of oxygen was sufficiently fast. The tent and mask methods were no doubt more effective, but the other method had the advantage of being easily applied and readily available in general practice.

Dr. Hughes quite agreed with Dr. Smith's remarks concerning the use of digitalis in pneumonia. He had at one time used it extensively in pneumonia, but had never observed any clinical effect or improvement. He thought that expectorant drugs were of little value in pneumonia. In the early stages of acute bronchitis in children free secretion could generally be encouraged by counter-irritation to the chest, and hot drinks with, possibly, a simple potassium citrate mixture. Belladonna was a particularly useful drug in bronchitic conditions in children associated with a spasmodic cough or an excessive amount of secretion.

In conclusion Dr. Hughes referred to the greater prevalence of chest complications in the acute respiratory diseases of children. It was sometimes a more difficult matter than in an adult to diagnose the presence of an empyema, and whenever a doubt existed, early exploratory punctures and X ray examination should be carried out. In infants aspiration alone, repeated if necessary, was the best treatment. In older children aspiration was

desirable when the empyema occurred during the attack of pneumonia; when it followed the attack, treatment by open operation was indicated. Dr. Hughes also stressed the importance of proper attention to minor attacks of bronchitis in children and to the period of convalescence after acute respiratory disease, particularly bronchopneumonia, thereby lessening the tendency to the development of chronic infections of the lungs.

Dr. GUY GRIFFITHS said that he would confine his remarks chiefly to lobar pneumonia, with occasional reference to bronchial pneumonia and bronchitis. If they only knew how, the wisest thing to do would be to neutralize the toxin; but up to the present they had been very little capable to that effect. The small amount of pneumonia antitoxin used so far showed that as yet few medical practitioners placed much reliance on it. It had been the same with diphtheria; only after a period had it been realized how the antitoxin should be used. Dr. Griffiths hoped for quicker means of typing or the production of a polyvalent serum for all types of infection, so that the use of antitoxin would become as usual in pneumonia as it was in diphtheria. In each disease the early use of serum was important. There was one form of pneumonia, that due to the streptococcus, in which serum seemed to be of great use, especially polyvalent serum. Yet such cases were comparatively rare and success was not invariable.

Treatment of pneumonia broadly consisted in relieving symptoms—and here they must rely a great deal upon the nurse—and in supporting the body against the effects of the disease, especially the circulatory and respiratory systems, which were most affected. The patient should be treated in a well ventilated room; the room should not be too hot, for cool air was of value in stimulating the body and in neutralizing toxins. In fact, the room should not only be well ventilated, but should be from time to time perfused; a draught should be allowed to blow through the room, while the patient was kept well covered. This procedure was a refreshing one for the patient.

There were various ideas about the best posture for the patient. It was usual now to see him propped up. But Dr. Griffiths thought it was best to keep the patient as flat as was comfortable for him; he did not know why the fashion had changed in this respect. Old writers had recommended recumbency and, in his opinion, it was of extreme importance.

Clothing should be light and loose. For a child there was nothing like a knitted woollen vest. Patients as young as eight or ten years rarely required poultices or cotton jackets. A jacket of impervious material was sometimes recommended, but Dr. Griffiths thought there was nothing so good as a plain knitted undershirt. To call a cotton jacket wool did not enhance its value at all. Frequent sponging was often very useful in relieving symptoms.

A few years ago oxygen was useless in this condition; but now, with the invention of the tent, it was of great value. Yet it was extraordinary how much some patients disliked the tent; they seemed to experience more discomfort under the tent than in the air. If no tent was available (Dr. Griffiths thought that the funnel was of no use), a catheter was useful, but it might be alarming to the patient. As a preliminary the patient might be given a glass nozzle connected with the oxygen supply to suck; this was often found to give comfort. Then, by degrees, the patient might be induced to introduce the tube into his nostril. It was remarkable that, though patients felt better for a short oxygen inhalation, they might feel worse after a long one. Dr. Griffiths thought it wise to let children suck the oxygen first.

Hot poultices with mustard were sometimes good, and Dr. Griffiths thought that if much more mustard were used the result would be better. He had seen no harm come from a mustard burn caused by a patient's mother.

Dr. Griffiths referred to the use of aperients and, if necessary, of a gastric tube, in case that dreaded complication, acute dilatation of the stomach, occurred. He spoke of the use of morphine for pain. If severe pleural pain was present, a hypodermic injection of one-eighth,

one-sixth or even one-quarter of a grain of morphine might be given. Short of the injection of morphine, Dr. Griffiths referred to a remedy advocated by Hardie Neil, of Auckland, at the Brisbane Congress in 1920, namely, the administration of a powder consisting of five grains each of barbitone, phenacetin and Dover's powder. This induced rest and sleep. He himself prescribed an ointment consisting of two grains of carbolic acid, thymol and menthol in half an ounce each of paraffin and lanoline. This was applied to the nose and, preventing soreness, allowed the nose to be blown freely by the patient.

Dr. Griffiths thought it possible for the toxin in this condition to be excreted by diuretics and purgatives. He did not believe in expectorants for lobar pneumonia, but he thought that mild diaphoretics were useful, and he approved of the use of potassium citrate. If toxin could be got rid of by the bowel or the bladder, it was all to the good. The use of citrate also decreased the effect of the calcium in the milk that must form the main diet, and prevented excessive calcification of the body. As well as milk in the diet, Dr. Griffiths believed in eggs. The patient should be given a nourishing diet from the beginning, because they never knew on the first or second day how the patient would be on the sixth. He should be fed well from the beginning and purged, if necessary.

Dr. Griffiths said that he always gave digitalis in this condition, not in heroic doses, but five to ten minims every four hours. By mouth it produced its effect slowly, and if the patient suffered from circulatory distress later, the action of the digitalis would be more rapidly produced. With the digitalis Dr. Griffiths always gave four grains of quinine. This was advocated by the late Sydney Jamieson, but Dr. Griffiths did not know how it acted. It had been said to be a specific, but he doubted this. Nevertheless quinine had an effect on muscle and might in this way keep up the strength of the heart. Strychnine was a valuable nervous and respiratory stimulant, though it was not much good for the heart. It might be given *per os* or hypodermically. Dr. Griffiths thought that camphor should be given only to patients who were failing; two grains in olive oil night and morning, or even every four hours, were not too much for an adult; but Dr. Griffiths never used huge doses. He did not prescribe alcohol at all; it was his rule never to prescribe alcoholic beverages in any circumstances. If a stimulant was required, 20 to 30 minims of *spiritus aetheris* with 20 to 30 minims of aromatic spirits of ammonia might be given. Drunkards had been alleged to have been made by doctors' prescriptions. Moreover, alcohol was not even a first rate drug, though it might be a good means of getting a man to sleep. Dr. Griffiths had been shocked to see what enormous doses were prescribed by some physicians; for instance, a pint of brandy and ten ounces of whisky every twenty-four hours. Many people said that alcohol was essential for patients who were used to taking alcohol, especially if delirium threatened; but Dr. Griffiths did not agree even with this.

In conclusion, Dr. Griffiths suggested that until a satisfactory antitoxin was discovered they must rely in pneumonia on good nursing, the relief of distressing symptoms and the support of the patient's system, especially the heart and the respiratory system.

Dr. M. C. LIDWILL asked whether Dr. Smith or any of the members present had had experience of the quick method of typing by mixing sputum with Type I or Type II antitoxin and noting the effects on the bacteria, the formation of rings round them, and so on.

In regard to anoxæmia, the first sign was cyanosis; it generally appeared first in the finger nails. As soon as this was noticed oxygen should be ordered. Dr. Lidwill did not agree with giving 5% carbon dioxide with oxygen as a routine measure. Many patients had pain and the 5% carbon dioxide and oxygen increased the respiratory excursions and so the pain. He himself ordered plain oxygen unless there was any indication for carbon dioxide. A patient inhaling 5% carbon dioxide with oxygen soon became very puffy. Dr. Lidwill prescribed plain oxygen, about ten litres per minute, rather than a mixture, and gave it more or less continuously.

In speaking of circulatory failure, Dr. Lidwill drew a diagram illustrating the neuro-muscular mechanism of the heart and stated that this mechanism, rather than the heart muscle itself, was damaged by pneumonia.

He was glad that Dr. Smith had given up the routine use of digitalis. He had never seen it have any effect in an uncomplicated pneumonia. Strychnine he had found useful. Camphor never seemed to do any good; it had no effect on blood pressure or pulse rate. Quinine, used in big doses at the Alfred Hospital, Melbourne, had been found to cause delay in resolution. Dr. Lidwill believed in the use of alcohol if the patient had a dry, brown tongue. Otherwise it might not be necessary; but, when given, it should be in large quantities, of six to eight ounces or more a day. Good whisky or brandy was the best; rum was not so good.

Dr. H. C. ADAMS said that one or two things had not been mentioned. Acute pleurisy was seen in a number of patients, preventing them from sleeping and causing much distress. One old treatment for relief of this pain had not been mentioned, and that was the application of leeches. The use of leeches was now forgotten and not used. But anyone who had seen a patient with pneumonia and pleuritic pain given early relief by the application of half a dozen leeches over the painful area would be convinced of the value of this treatment.

In a certain type of case in which circulatory failure occurred, venesection was of value. Dr. Adams did not think the amount of blood removed by venesection should be large, but to the extent of about eight ounces. The relief given by this procedure was amazing. Dr. Adams had recently seen one instance in which venesection appeared to turn the tide in the patient's illness. But if it was performed, it should not be left too late.

Dr. S. ROSEBERY said that in cases of anoxæmia or capillary collapse saline solution with 15% to 20% glucose gave beneficial results. He had tried it recently in many of his cases and had found that it helped cyanosed patients through the critical stages of the disease, and it also acted as a nutrient.

In regard to the difficulty of obtaining sputum from children, Dr. Rosebery suggested that lung puncture should be done and the typing then carried out. He had seen this done at the Brompton Hospital and the Hospital for Sick Children, Edinburgh. The quick typing that Dr. Lidwill mentioned was simple, easily done and reliable.

In anoxæmia Dr. Rosebery had seen oxygen given intravenously. This seemed a drastic measure, but had dramatic results.

To a certain extent it might be said that expectorants were not very beneficial; but large doses of potassium iodide seemed to loosen the sputum. The withdrawal of ten to twelve ounces of blood by venesection was also very beneficial in the markedly cyanosed.

Dr. COTTER HARVEY said that from Dr. Smith's closely reasoned address he had received one unpleasant shock. It would appear that he was about to play with a moon-beam from the lesser lunacy; for, at the request of Professor Lambie, he was about to perform artificial pneumothorax in a series of such cases. The principle involved was that of stimulating a premature crisis, a procedure that he hoped would be discussed during the evening. There were several methods, apparently successful, for doing this, among them being the injection of sodium nucleinate and the giving of pneumococcal vaccine. He did not know whether anyone had had any experience with these in this country.

From the literature it appeared that artificial pneumothorax was able to produce a crisis, if induced at an early stage. It had, of course, a definite value in allaying the pleural pain, though this alone would not justify its adoption. The procedure to be followed was to introduce some 400 cubic centimetres of air into the pleural cavity; this might, if necessary, be followed in twenty-four hours by another 400 cubic centimetres. Though in theory it might be argued that this would aggravate the anoxæmia, it appeared in practice not to do so; nor in such amounts was there any reason why it should. It was, of course,

necessary, to be of any value, that this procedure should be adopted in the first three or four days of the illness.

Dr. C. G. McDONALD added his congratulations to those already offered to Dr. Smith. He was glad to hear him emphasize the value of morphine in pneumonia. The treatment of pneumonia, broadly speaking, was rest, good nursing, the least possible interference by the physician, and the administration of oxygen early. Dr. McDonald agreed strongly with Dr. Smith as to the giving of "Carbogen". Patients seemed to appreciate oxygen with 5% carbon dioxide better than plain oxygen; and oxygen, if given, much interfered with the respiration of the patient, made it difficult for him to breathe, and caused discomfort.

Dr. McDonald had listened with admiration to the meticulous detail of the treatment advocated by Dr. Griffiths. But he thought Dr. Griffiths was mistaken in so strongly attacking the prescription of alcohol. He did not think that alcohol played a specific part in treatment of the condition, but he did think that it would be wrong to withhold alcohol in reasonable doses when it gave the patient comfort and enjoyment.

Dr. McDonald had been intrigued to hear Dr. Smith speak of the cause of death in pneumonia and to hear him go back to the view extant years previously that the patient died because of failure of the peripheral circulation. He would like to have that demonstrated. Poisons were absorbed from a focus in the lung and it was reasonable to infer that they had some baneful influence on the cardiac musculature. The pulse was rapid from the beginning, which would suggest that the cardiac muscle was weakened by the infection. But in the last stages general circulatory failure from poisoning of the vasomotor centre might be responsible. This was suggested by the result of pressure on the skin of patients with cyanosis in pneumonia just prior to death.

Dr. McDonald wished that Dr. Smith had had time to consider the treatment of bronchitis in the same delightful fashion in which he had dealt with the treatment of pneumonia. An important point in the treatment of bronchitis was the necessity for putting patients to bed. He had been asked to see children who had had a cough going on for months and in whom bronchiectasis was suspected. The history was usually that the child had a cold and that after a day or two in bed the mother thought that the child should go into the sun. So that, instead of the child being kept in bed, it got up and its condition consequently became much worse. By the simple expedient of keeping the child in bed the alleged bronchiectasis would frequently disappear. Potassium iodide was the only drug on which any reliance could be placed in the treatment of bronchitis, and morphine the only reliable drug in pneumonia.

In conclusion, Dr. McDonald congratulated Dr. Smith on the way in which he had presented his views. The subject was a difficult one to present in an interesting way.

Dr. ALAN WALKER said that he could not share Dr. McDonald's scepticism in regard to early vasomotor failure in pneumonia. Although the myocardium was affected by the disease and the raised metabolism, nevertheless it stood up to it well; a healthy myocardium would stand the strain. In the circulatory failure seen in young people the heart usually did its work very well; it was the peripheral circulation that failed. At the same time they must remember that *post mortem* histological methods were crude and that it was impossible to estimate the effect on the cardiac muscle.

Dr. Walker defended Dr. Lidwill in his remarks concerning the damage to the nervous element of the heart by infection.

He did not regard artificial pneumothorax with such horror as Dr. Smith. There were two methods of application: the first for the relief of pain by separation of inflamed pleural surfaces, and the second by serial injection of air or oxygen. The object in the second method was to procure a premature crisis and it was the more drastic. Dr. Walker had no personal experience, but thought that he would hesitate to do this without first injecting a small amount of air to see how the patient

tolerated it. He thought that all would agree with the exponents of this method, who admitted that they would never recommend anyone to gain his experience of artificial pneumothorax in pneumonia.

Quinine, Dr. Walker thought, might be of benefit in a few cases, but an English physician had told him that he had had one bad fright with it in a child who developed amblyopia.

Dr. Walker appreciated what Dr. Smith said in regard to "Carbogen", but there was something to be said also for Dr. Lidwill's views. He doubted whether there was any need for giving carbon dioxide when a tent was used; the rebreathing of the air might supply enough carbon dioxide.

Dr. Walker said that the many ideas about the treatment of pneumonia fell into two categories. In the first category were the empirical ideas, which were perhaps held in ignorance. The second depended on principles that they believed to be true. Each practitioner must treat his patients by the methods of his conviction. But Dr. Walker would like to direct attention to the method of Dr. Smith's presentation of his paper, in which treatment was discussed in the light of underlying principles. Practitioners should have good reason for all that they did, and their evidence should be as scientific as possible.

In conclusion, Dr. Walker said that he disagreed with Dr. Griffiths in the giving of purgatives and diuretics. He remarked that there was no evidence that purgation and diuresis could have any effect in eliminating toxins. The patient should be as little disturbed as possible.

Dr. KEMPSON MADDOX said that it seemed unscientific to blame either the heart or the peripheral circulation for the fatal issue. Dilatation of the heart occurred early in the disease; and had been shown by radiological examination to reach a maximum at the height of the toxæmia. He thought that there was clear evidence that the heart was partly responsible for circulatory failure.

Concerning the question as to whether "Carbogen" or oxygen alone was better, Dr. Maddox referred to the important vaso-constrictor effect of carbon dioxide. The use of "Carbogen", therefore, might prevent or relieve stasis in the peripheral vessels. Cyanosis, however, was not necessarily due to peripheral stasis, and he thought that "Carbogen" and oxygen might be better used alternately. As to the discomfort experienced by the patient, in the usual cheap and small tent the patient was naturally uncomfortable. There should be available, at least in the larger public hospitals, machines of a good make, where provision was made for cooling or drying of air to do away with any feeling of confinement.

Diathermy of the chest in pneumonia was sponsored by distinguished physicians in other countries. The application of heat was useful in limiting the spread in pneumonia, by mobilizing the local defences in the healthy lungs near the infected area.

Digitalis was used on the assumption that if fibrillation occurred the heart would already be digitalized and sensitized. But in these days of digoxin even that argument disappeared.

In regard to adrenaline, Dr. Maddox referred to Dr. Blackburn's enthusiasm for its use, five minims every four hours, in pneumonia. It seemed to be of definite assistance and Dr. Maddox had never seen it do any harm. If the patient was to be thus deprived of its full effect in a crisis, pituitrin or ephedrine could be used instead.

In conclusion, Dr. Maddox seconded Dr. Walker's remarks concerning Dr. Smith's address. It was refreshing to hear a paper delivered without the monotony that was inevitable in papers that were read.

Dr. A. J. COLLINS extended his thanks to Dr. Smith and to the speakers for a very enjoyable and informative evening. He had been most interested to hear Dr. Harvey speak of his experience of the treatment of pneumonia by artificial pneumothorax. But it seemed very risky. Rupture of the lung might easily be brought about. The danger of the procedure had been brought home to him by experiences at the Royal Prince Alfred Hospital, when

a rupture occurred during collapse of a lung that was the site of an abscess. Dr. Harvey had said that the object of artificial pneumothorax was to produce a crisis; Dr. Collins hoped that the crisis produced would be the one that was desired.

Diathermy might be useful in the treatment of unresolved pneumonia, but not in the acute form. The application of heat was helpful in accelerating the resolution of a pneumonic lung.

Dr. Smith, in reply, thanked the speakers for their remarks. He had tried to keep his remarks on the plane of principles, because if he had proceeded to discuss the subject from the point of view of practice, it would have resolved into a number of statements that might or might not be of value. At the same time he would hesitate to discourage any form of treatment in which a medical practitioner had confidence, providing it involved no discomfort to the patient. Dr. Smith was not advocating these principles to be used in any and every case. In defining principles of treatment he meant that those principles should be used intelligently, in other words, when the indications were present. For example, cyanosis was more respiratory than circulatory, and although it was not invariably indicative of anoxæmia, the use of oxygen or "Carbogen" was indicated when cyanosis was present. "Carbogen" increased the depth of respiration. Obviously one would not use "Carbogen" if it was likely to cause distress to the patient. But as a rule the patient was more comfortable with "Carbogen" than with oxygen.

Circulatory phenomena in pneumonia afforded the most difficult aspect of the whole question from the point of view of underlying causes and treatment. It was accepted without sufficient thought that the cause of circulatory failure was always cardiac. Dr. Smith was not referring now to the phase immediately before death, but to the phenomenon at the height of the disease. In some instances the cause was cardiac, but not in all. In some there was peripheral failure, and this in the days of the disease before the fatal issue became inevitable. Certainly the observations made upon the heart in patients who died from pneumonia showed little anatomical change in the muscle. But the method of examination was crude. Moreover, permanent organic damage to the heart was rare in pneumonia if the heart was normal previously. Further, perfusion of blood seemed to indicate that the heart stood up very well to the work put upon it, in spite of the toxæmia and the increase in blood pressure.

In regard to quick typing, Dr. Smith said that he had had no experience at all. Dr. Tebbutt had done some typing for him and had tried the quick method, but so far suspended judgement. Dr. Tebbutt had a grievance against physicians for not giving him more opportunity of carrying out this work for them.

Dr. Smith said that perhaps he had spoken too strongly about artificial pneumothorax. But he was thinking of the method of producing complete pneumothorax rapidly early in the disease. Was it necessary, he asked, to indulge in a method that was not without risk or discomfort when they had morphine and oxygen? Moreover, pain in pneumonia did not persist and was easy to relieve without introducing air or oxygen into the pleural cavity. When he had expressed horror at the procedure he had in mind the severity of the measure and the fact that in most cases of pneumonia the amount of lung inflamed was not the whole of the lobe, so that it would be putting out of action a large ventilating surface of the lung and might increase anoxæmia. The principle of treatment was to create conditions as favourable as possible, so that the *vis medicatrix nature* might exert its effect. The anoxæmia should be removed as far as possible. Complete collapse of the lung must increase the anoxæmia, and Dr. Smith was not convinced that it was a suitable method of treatment. He felt that the patients should be worried as little as possible. A large number did not need any more than the minutiae that Dr. Griffiths described. In those patients in whom toxæmia was considerable, more intensive methods might have to be used.

In conclusion, Dr. Smith emphasized the necessity for basing practice on principles.

SCHOLARSHIPS AND GRANTS IN AID OF SCIENTIFIC RESEARCH.

Scholarships.

THE Council of the British Medical Association is prepared to receive applications for research scholarships as follows:

An Ernest Hart Memorial Scholarship, of the value of £200 per annum.

A Walter Dixon Scholarship, of the value of £200 per annum.

Three Research Scholarships, each of the value of £150 per annum.

These scholarships are given to candidates whom the Science Committee of the Association recommends as qualified to undertake research in any subject (including state medicine) relating to the causation, prevention or treatment of disease.

Each scholarship is tenable for one year, commencing on October 1, 1935. A scholar may be reappointed for not more than two additional terms. A scholar is not necessarily required to devote the whole of his or her time to the work of research, but may hold a junior appointment at a university, medical school or hospital, provided the duties of such appointment do not interfere with his or her work as a scholar.

Grants.

The Council of the British Medical Association is also prepared to receive applications for grants for the assistance of research into the causation, treatment or prevention of disease. Preference will be given, other things being equal, to members of the medical profession and to applicants who propose as subjects of investigation problems directly related to practical medicine.

Conditions of Award: Applications.

A copy of the regulations relative to the award of the scholarships and grants for 1935 and of the prescribed application form can be obtained on application to the Secretary of the Federal Council of the British Medical Association in Australia, British Medical Association House, 135, Macquarie Street, Sydney. The completed application form is required to be submitted to the Secretary of the Federal Council not later than March 2, 1935.

Applicants are required to furnish the names of three referees who are competent to speak as to their capacity for the research contemplated, to whom reference may be made.

G. C. ANDERSON,

Medical Secretary.

British Medical Association House,
Tavistock Square,
London, W.C.1.,
September, 1934.

NOTICE.

THE Librarian of the New South Wales Branch of the British Medical Association is anxious to complete his set of *The British Journal of Surgery* and would be glad to receive from members copies of the missing numbers. The numbers required are as follows; Volume VII, 1919-1920, all numbers; January, 1921; July, 1922; January, 1923; January, 1924.

Correspondence.

THE MORTALITY IN APPENDICITIS.

SIR: I have been following with keen interest the discussion in the journal regarding the increased mortality

from appendicitis in recent years. There seems a disposition in some quarters to ascribe some at least of the increase to the increasing number of operations for this disease performed by general practitioners, especially those in the country, the inference no doubt being that if more of these went to specialists, preferably to those belonging to the magical College of Surgeons, many more lives would be saved.

Now, Sir, I cannot speak for general practitioners in the city, nor even for others in the country, but, after close on ten years' experience, operating on hundreds of cases of appendicitis of all types and grades of difficulty, I can say that I have not lost one, though in two cases I did not even see the appendix at all, being content to drain; in my humility, thinking that a reputation, like that of the North-West Mounted Police, of always "getting his man", should be sacrificed in the patient's interest when it was a question of prolonged handling of inflamed bowel. Both patients are alive, though one has a sinus persisting. This experience must be typical of many hundreds of general practitioners throughout Australia; and why not? Have many of these critics in high places been in country hospitals? Do they think that these operations are done on the kitchen table? Country hospitals today compare more than favourably in the majority of cases with those in the city. Take our own hospital here—of about twenty beds—a fair sample, because of its relatively small size. Staff: matron, two sisters and usual number of nurses. Theatre equipment: steam sterilizer of latest pattern, shadowless light, two other lights, movable spot light, ether machine and sucker, full instrument equipment, modern table, hot and cold water, electric emergency sterilizer, "Carbogen" unit, oxygen unit; on the anæsthetic table will be found all the emergency drugs, such as "Coramine", "Coagulen" *et cetera*. Given equal facilities and reasonable technical skill and clinical judgement, my impression is that patients in the country do better after operation than they do in the city. Wounds heal quickly and convalescence is quicker and smoother. Many of these country towns are situated in the highlands, with perfect climates; the hospitals are often in extensive grounds, surrounded by healthful eucalyptus trees, not, like some famous city hospitals, cooped up in squalid industrial areas. Given a chance, patients must do well.

If there is anything in these gratuitous innuendoes about the alleged dire results following surgical interference by general practitioners, and if it is not merely propaganda to stampede country and city patients towards languishing city surgeons, let the honorary surgeons in the big hospitals be less hungry for operating than they have been in the past and give their energetic, and mostly capable, residents a chance to gain technical skill in operating under expert guidance. I knew a very brilliant interne who got a prize in his course for surgery. After six months in a big hospital, luck so happened that one of the urologist's patients had a foreskin so tight that the cystoscope would not pass through. With a munificent gesture the great man invited my friend to perform a circumcision. Overcome with gratitude and pride at such an honour (for he had been but six months on the surgical side) my friend was that nervous that he had to be assisted by one of his envious colleagues. But such good fortune was not to last, for that was his one and only operation at that famous training centre, whilst most of his contemporaries did not open their account at all. But they could write "histories" all right! Thus are surgeons trained!

Yours, etc.,

BERTRAND COOK.

Boorowa,
New South Wales,
October 27, 1934.

MEDICINE AND THE MICROPHONE.

SIR: There is probably nothing in which the common man is more interested than his own health; yet on no subject is he more willing to accept the advice of a

kindly, but ignorant, friend, or that of some charlatan with an ax to grind. A few hours' work in the out-patient department of any large hospital is certain to discover the presence of patients who have added to their woes by accepting the medical counsel of neighbours, or by the employment of some hit-or-miss "remedy" purchased over a druggist's counter. This trust in the medical knowledge of ignoramuses and quacks is a queer but almost universal attribute of the mind. Yet it does not seem to prevail in other fields of human affairs; he who purposes to build a house, buy himself a new suit or enter into some nice legal agreement usually disdains the opinions of the man next door. Almost invariably, he transacts his business through some expert in the matter concerned. But all too frequently in cases of illness the quack and the patent medicine come first, with the doctor a bad second. It may be that this particular brand of credulity is rooted, at least in part, in the belief that doctors' fees are too high, and thus put skilled treatment beyond the reach of many. But none of us can doubt that many diseases owe their increasing mortality rate to the fact that proper treatment is often instituted at too late a day.

Thus it is that, in fair weather or foul, the race of impostors flourishes exceedingly, and the vendors of a thousand nostrums grow fat. The quack and the manufacturers of useless and sometimes dangerous "remedies" keep a ready finger on the public pulse; they are quick to profit by the general lack of knowledge in all that pertains to personal health and hygiene. These exploiters of human ignorance are the more dangerous in that they now employ as their sharpest weapon that most efficient of devices for the spread of information—broadcasting.

Broadcasting in Australia will perhaps one day be transformed into the thing it now should be—a great public utility devoid of all taint of commercialism. Some think that advertising "over the air" should be forbidden by statute and that advertisers can obtain a market for their goods through the medium of the Press. Certain it is that wireless advertising is unknown in Great Britain, and that even in the United States of America winged words about tooth paste and tonics do not receive the breathless attention from listeners that once they did. And there can be no doubt that those stations in this Commonwealth which derive their revenue from advertising would serve the public interest and earn public gratitude by refusing to admit into their studios all patent medicine vendors and all members of the noble army of quacks. It is nothing short of a scandal that listeners should be regaled with dissertations, emanating from the larynx of some pretentious humbug, on such diseases as diabetes, pernicious anemia, arteriosclerosis and chronic constipation. This whole problem has an important bearing on the well-being and the pockets of the community; and the medical profession, if it seeks to advance with the times, should be ready with a solution. The suggestion here advanced is, simply, that all wireless talks on health and disease should be the prerogatives of qualified medical men, speaking anonymously and, preferably, without fee.

Medical subjects, more so perhaps than many other scientific topics, can be of supreme interest to the intelligent listener or reader. The writings of H. G. Wells, Julian Huxley, Sir Ray Lankester and Sir Arthur Shipley on various biological questions are as alluring as the most thrilling novel; they hold the reader spellbound. The illuminating astronomical treatises of Sir James Jeans were born of a series of wireless talks which fascinated England for nights on end. But speakers on popular medicine must be well chosen. They must be prepared to select, sub-edit and brighten up their talks with infinite care. And they must possess those priceless assets of the lecturer—a pleasant voice and the knowledge of how it should be used. Such men may be difficult of discovery; but only by finding them will we deliver our fellows from the wiles of self-seeking rogues and do a little tilling in our own legitimate fields.

Yours, etc.,

"GENERAL PRACTITIONER."

October 25, 1934.

Obituary.

DANIEL KELLY.

WE are indebted to Dr. Richard Vallack and Dr. Gilbert G. Bradley for the following appreciation of the late Dr. Daniel Kelly.

The passing of Dr. Kelly at the comparatively early age of fifty-nine years has removed from our midst one whose life and work will long remain an example of devotion to a high ideal and of service to the common good. The great hospital which he brought into being and nurtured to robust life will stand for all time as a monument to his memory. To quote Horace: "*Exegi monumentum aere perennius.*" The entire staff of the hospital, past and present, mourn his loss, for he was the centre and soul of all its activities. He and the hospital were one.

It is now thirty-one years since Daniel Kelly first commenced practice in North Sydney. His cheerful good nature, his admirable bedside manner (which he retained throughout life), his kindness and his marked professional ability soon built for him a practice the size and scope of which has rarely been exceeded. Even now, eighteen years after his quitting general practice, one meets hosts of old patients and friends who still speak in affectionate and loving terms of the big, sympathetic doctor whom they knew and loved so well. All classes of the community held him in high esteem, for his devotion and sympathy went out to all, irrespective of class or creed.

In 1916 Dr. Kelly decided to leave general practice in order to specialize in general surgery, and after a long trip to Europe and America he commenced full consulting practice in Macquarie Street. Always eager for greater and wider knowledge, he regularly made trips abroad to the great surgical centres of the world. He numbered amongst his personal friends many of the leaders of medical thought in Europe and America. But specialization and deeper knowledge did not for one moment dim the youthful resiliency of his fine, happy disposition. Even through his last long illness frequent flashes of the old *joie de vivre* were apparent, and a well timed jest or the recounting of some humorous anecdote still evoked a ready response.

It was Dr. Kelly's often expressed opinion that, while allowed a special forte, a good surgeon should be capable of executing any operation in surgery. He ably fulfilled his own tenet. It has been our pleasure to see and assist his skilful work in every branch of surgery, but it was his abdominal and gynaecological work in particular that we recognized as outstanding. As his past residents and later his contemporaries on the Mater Misericordiae General Hospital staff, we recall with pride his surgical and administrative achievements, but with even greater pride we shall always remember the wonderful example of moral strength and ethical rectitude that he has bequeathed to us all. Not only can we not remember one single lapse from his own high standards, but we have never even heard the faintest suggestion of such from anyone.

As two of the band of many younger men who owe so much to Dr. Kelly we will remember him as he would wish to be remembered, a broad-minded Christian gentleman who fearlessly followed the highest ideals of his religion and profession and who rendered a sterling service to his fellow men.

ROBERT CHARLES WITHINGTON.

WE regret to announce the death of Dr. Robert Charles Withington, which occurred on October 16, 1934, at Caulfield, Victoria.

LILIAN HELEN ALEXANDER.

WE regret to announce the death of Dr. Lilian Helen Alexander, which occurred on October 18, 1934, at South Yarra, Victoria.

HAROLD THORNTON BOURNE.

WE regret to announce the death of Dr. Harold Thornton Bourne, which occurred on October 19, 1934, at Kew, Victoria.

Corrigendum.

THE attention of readers is drawn to an error that has occurred in the report on "The Occurrence of Leptospirosis (Weill's Disease) in Australia", which appeared in the issue of October 13, 1934, under the caption "Public Health". On page 497, in the second paragraph of the second column, "calcium cyanide" should read "calcium cyanamide".

Books Received.

MODERN ADVANCES IN DISEASES OF THE THROAT, by A. Miller, F.R.C.S., D.L.O.; 1934. London: H. K. Lewis and Company, Limited. Demy 8vo., pp. 132, with illustrations. Price: 10s. 6d. net.

CLINICAL MISCELLANY, The Mary Imogene Bassett Hospital, Cooperstown, New York; Volume I; 1934. London: Baillière, Tindall and Cox; Baltimore: Charles C. Thomas. Royal 8vo., pp. 206, with illustrations. Price: 13s. 6d. net.

Diary for the Month.

- Nov. 5.—New South Wales Branch, B.M.A.: Organization and Science Committee.
 Nov. 6.—Tasmanian Branch, B.M.A.: Council.
 Nov. 7.—Western Australian Branch, B.M.A.: Council.
 Nov. 9.—Queensland Branch, B.M.A.: Council.
 Nov. 13.—Tasmanian Branch, B.M.A.: Branch.
 Nov. 13.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 Nov. 14.—Victorian Branch, B.M.A.: Branch.
 Nov. 20.—Tasmanian Branch, B.M.A.: Council.
 Nov. 20.—New South Wales Branch, B.M.A.: Ethics Committee.
 Nov. 21.—Western Australian Branch, B.M.A.: Branch.
 Nov. 21.—Victorian Branch, B.M.A.: Clinical.
 Nov. 22.—New South Wales Branch, B.M.A.: Clinical.
 Nov. 23.—Queensland Branch, B.M.A.: Council.
 Nov. 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 Nov. 28.—Victorian Branch, B.M.A.: Council.
 Nov. 29.—South Australian Branch, B.M.A.: Branch.
 Nov. 29.—New South Wales Branch, B.M.A.: Branch.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xviii, xix and xxi.

- AUSTIN HOSPITAL FOR CHRONIC DISEASES, HEIDELBERG, VICTORIA: Honorary Surgeon.
 HOBART PUBLIC HOSPITAL, HOBART, TASMANIA: Junior Resident Medical Officers.
 LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officers.
 MARRICKVILLE DISTRICT HOSPITAL, MARRICKVILLE, NEW SOUTH WALES: Honorary Junior Medical Officers.
 PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Resident Pathologist and Biochemist.
 ROYAL HOSPITAL FOR WOMEN, PADDINGTON, SYDNEY, NEW SOUTH WALES: Honorary Biochemist.
 SYDNEY HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers.
 THE EASTERN SUBURBS HOSPITAL, SYDNEY, NEW SOUTH WALES: Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associated Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL are advised, in their own interests, to submit a copy of their agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	Officer of Health, District Council of Elliston. All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor", THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £1 for Australia and £2 5s. abroad per annum payable in advance.